The Hidden Heterogeneity of Inflation Expectations and its Implications[*]

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Abstract

Using a new consumer survey dataset, we document a new dimension of heterogeneity in inflation expectations that has implications for consumption and saving decisions as well as monetary policy transmission. We show that German households with the same inflation expectations differently assess whether the level of expected inflation and of nominal interest rates is appropriate or too high/too low. The 'hidden heterogeneity' in expectations stemming from these opinions is related to demographic characteristics and affects current and planned spending in addition to the Euler equation effect of the perceived real interest rate.

Keywords: Macroeconomic expectations, monetary policy perceptions, survey microdata.

JEL classification: E31, E52, E58, D84.

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1   Introduction

In recent years, a large literature has developed that focuses on the formation of consumers' macroeconomic expectations. Phenomena such as the tendency of consumers to overestimate actual inflation or patterns in forecast accuracy across socio-demographic groups have been widely observed across different surveys and countries (Jonung, 1981; Bryan and Venkatu, 2001; Coibion and Gorodnichenko, 2015). Several papers have shown that inflation expectations are formed heterogeneously and document that these heterogeneous expectations have implications for consumption and saving decisions (Bachmann et al., 2015; Duca et al., 2018; Dräger and Nghiem, 2019).

In this paper, we present new evidence regarding the relevance of opinions on expected future economic developments. Specifically, we show that even households with the same inflation expectations can have very different opinions about the appropriate level of inflation and interest rates, and thereby about the right stance of monetary policy. This heterogeneity has implications for the transmission channel of monetary policy.

We first detail the 'hidden heterogeneity' in expectations using the Bundesbank Online Pilot Survey on Consumer Expectations. Overall, the majority of consumers believe that expected inflation is too high and expected interest rates are too low. Remarkably, even consumers with inflation expectations that are well within the ECB's target inflation rate of close to, but under 2%, differ substantially in their opinions whether this is an appropriate level of inflation. Specifically, for consumers with inflation expectations between 1.5% and 2%, about 49% believe that expected inflation is appropriate, 46% think it should be lower and 5% think it should be higher. Strikingly, even among consumers who expect deflation in the next year, about 30% would still prefer lower inflation. Generally, a large share of German households believes that inflation is too high. We observe similar heterogeneity also for consumers' opinions regarding the stance of monetary policy, i.e., future interest rates.

We further document that these differences in attitudes result in some heterogeneity in households' consumption and savings profiles, even for consumers who share similar inflation expectations. This implies an additional channel of monetary policy transmission via the attitudes of households. Monetary policy changes can potentially have different effects on households that are savers compared to those that are net debtors. Net savers' disposable income actually increases when interest rates increase (wealth effect) and thus they could spend more when interest rates go up. On the other hand, the disposable income of net debtors could decrease after an increase in the policy rate if they possess a variable rate mortgage, and thus they could spend less. However, spending depends also on inflation expectations via their effect on the real interest rate. We find that when households perceive higher real rates, they postpone part of their spending on durable goods. This effect is in line with the theory, namely the intertemporal substitution effect in the consumption Euler equation. Interestingly, the negative effect of perceived rates is only significant for consumers with inflation expectations in line with the ECB target, i.e., between 1.5% and 2%. Furthermore, those who believe interest rates should be lower in the future, are de facto acting as if (nominal) interest rates – and thus real interest rates – are already lower, as they have significantly higher durable goods spending and also a higher negative elasticity with respect to real rates. Interestingly, the

effect of attitudes is not only relevant for current spending decisions, but also affects future planned spending on durable goods in a way which is consistent with theory. Distinguishing further between homeowners and renters, we find opposing effects of preferring lower inflation on current durable goods spending: Homeowners report lower current spending when they think inflation should be lower (in line with an Euler equation), while renters report higher durable goods spending.

Our paper relates to the literature explaining the heterogeneity of expectations across socio-demographic groups. Earlier contributions by Jonung (1981), Bryan and Venkatu (2001) and Pfajfar and Santoro (2009) demonstrate higher levels of both perceived and expected inflation for women, low education and low income groups, with a u-shaped effect of age where young and old respondents have higher expectations than middle age respondents. This pattern is highly prevalent in many different surveys across both different countries and time spans. More recent approaches by D'Acunto et al. (2019) and D'Acunto et al. (2019) demonstrate that the gender differences in inflation expectations can be traced to differences in daily grocery shopping experiences (as hypothesized in Jonung, 1981) and that they spill over into gender differences in expectations on other macroeconomic variables. Moreover, Ehrmann et al. (2017) demonstrate that consumers' attitudes like optimism or pessimism regarding the economic outlook influence also the level of inflation expectations, while D'Acunto et al. (2019) show that cognitive abilities play an important role. Finally, personal inflation experience can explain some of the differences in inflation expectations across age cohorts (Malmendier and Nagel, 2016) and across different political systems, e.g. the Western part of Germany and the former German Democratic Republic (GDR) in the East of Germany before 1989 (Goldfayn-Frank and Wohlfahrt, 2019).

Our paper is related also to a growing literature evaluating the link between survey inflation expectations and household spending decisions. Assuming consumers are following an Euler equation, one would expect a positive effect from higher inflation expectations on current spending via its effect on the real rate, which could become particularly important when nominal interest rates are at the zero lower bound. While Bachmann et al. (2015) and Burke and Ozdagli (2013) find little evidence of a significant link between inflation expectations and consumers' reported readiness to spend (or actual spending) on durables in the US, Crump et al. (2015) report a positive relation between consumption growth and inflation expectations of US consumers in the Survey of Consumer Expectations (SCE) conducted at the New York Fed. Other studies on European and Japanese households find significantly positive links between household inflation expectations and (intended or actual) spending on both durables and non-durables (Ichiue and Nishiguchi, 2015; D'Acunto et al., 2016; Dräger and Nghiem, 2019; Duca et al., 2018; Vellekoop and Wiederholt, 2018).

The remainder of the paper is organized as follows: Section 2 explains the data we use, while Section 3 discusses our results. Section 4 concludes.

2 Data

Our research question is evaluated using a new survey dataset coming from the Bundesbank Online Pilot Survey on Consumer Expectations, which was fielded on a representative sample of German

households in three waves from April 2019 to June 2019. Overall, the dataset includes 6653 observations, with 2009 participants in the first wave, 2052 in the second wave and 2592 in the third wave. In addition, the survey includes a panel component, as about 500 respondents participated in all three waves, 500 in wave 1 and 2, 500 in wave 2 and 3 and 500 in wave 1 and 3. For our analysis, we use mainly the first and second wave of the dataset and thus have about 1000 participants with responses in both waves.

The Bundesbank Online Pilot Survey on Consumer Expectations core questionnaire asks about consumers' macroeconomic expectations, housing market expectations and housing choices, spending and saving choices and plans as well as a large range of socio-demographic characteristics. We add the following questions to the core questionnaire. First, after the question on point estimates for inflation 12 months ahead, we ask about opinions on the expected level of inflation (included in the first wave):

1. Do you think the average level of inflation you expect for the next 12 months will be more or less appropriate, or do you think a higher or lower inflation rate would be better?

    (a) Higher inflation than expected would be better (*d_infl_highbetter*)

    (b) Inflation will be more or less appropriate (*d_infl_reason*)

    (c) Lower inflation than expected would be better (*d_infl_lowbetter*)

Similarly, we ask about opinions on the expected level of nominal interest rates after the question on point estimates for expected saving rates in the next 12 months (included in the second wave):

2. Do you think the average level of interest rates you expect for the next 12 months will be more or less appropriate, or do you think a higher or lower interest rate would be better?

    (a) Higher interest rate than expected would be better (*d_int_highbetter*)

    (b) The interest rate will be more or less appropriate (*d_int_reason*)

    (c) Lower interest rate than expected would be better (*d_int_lowbetter*)

In our analysis, we further control for quantitative point forecasts for the next 12 months regarding consumer price inflation, π^e, the average savings rate, $i^e_{savings}$ and the average mortgage rate, $i^e_{mortgage}$. In order to avoid an effect from extreme outliers, inflation expectations are truncated in the range between -5% and +25%, interest rate expectations are truncated to be below or equal to 25%.

Socio-demographic controls comprise a dummy variables for being male (*d_male*), age, three income groups (*inc_low* – monthly net income below or equal 1.000 €, *inc_middle* – monthly net income between 1.000 € and 3.000 € and *inc_high* – monthly net income above 3.000 €), four education groups (*edu_haupt* – lowest highschool level in Germany (Hauptschule), *edu_real* – medium highschool level in Germany (Realschule), *edu_abi* – highest highschool level in Germany enabling to study at a university (Abitur), *edu_uni* – university degree), three work categories (*d_fulltime* – working full time, *d_parttime* – working part time, *d_noemploy* – no employment (voluntary or

involuntary), *d_retired* – retired) and a dummy for having lived in the GDR (German Democratic Republic in the Eastern part of Germany) before 1989 (*d_east1989*).

Finally, we evaluate implications of opinions on inflation and interest rates for spending and saving decisions. These include levels of spending in the previous month on durables (*spentlastmon_dur_ltrunc*), consumption goods (*spentlastmon_cons_ltrunc*), housing (rent or mortgage payments, *spentlastmon_house_ltrunc*) and saving (*spentlastmon_save_ltrunc*), all measured in Euros. We use log levels and truncate the highest 5% in order to exclude unreasonable values. The fact that the survey asks to report actual spending in Euros represent an important advantage over surveys measuring only consumers' readiness to spend. Spending plans are measured with qualitative questions asking for plans to spend/save more/about the same/less on the same categories in the next 12 months. We define dummy variables for those planning to spend more on durables (*d_spendintent_dur*), consumption goods (*d_spendintent_cons*), housing (*d_spendintent_house*) and saving (*d_spendintent_save*).

3   Results

3.1   Summary Statistics: The Hidden Heterogeneity of Expectations

Table 1 shows a cross-tabulation of our variables of interest. From this table we observe that the majority of households (43%) express that inflation should be lower and interest rates should be higher. This would be consistent with a Taylor rule. 38% of the surveyed population feel inflation will be at a reasonable level and 16.8% have the same opinion regarding interest rates. However, only 7.4% of our sample think that both inflation and interest rates will be at appropriate levels. Hence, our sample has many individuals who feel that inflation as well as interest should be different from the levels that they currently expect. The majority opinion on interest rates is perhaps not surprising, given that the main refinancing rate was zero for a protracted period of time when the respondent were surveyed. The views that inflation should be lower, at a time with very moderate price movements, could be explained by the overall negative attitude towards inflation in Germany.

Table 1: **Opinions on Expected inflation and Expected Interest Rate**

	Expected interest rate				
Expected inflation	higher better	reasonable	lower better		Total
	%	%	%		%
higher better	3.4	1.2	0.2		4.8
reasonable	28.9	7.4	1.9		38.3
lower better	43.0	8.1	5.8		56.9
Total	75.3	16.8	7.9		100.0

As a next step, we explore our variables of interest visually by plotting the opinions against the levels of the underlying expectations. Figure 1 plots various opinions against macroeconomic expectations. To help with the interpretation, we smooth the individual observations using a Lowess smoother. As we can see, there is a substantial heterogeneity of opinions. First, in Figure 2(a) we

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plot the share of people believing that inflation will be reasonable, should be higher or should be lower against their own expected inflation rate in 12 months. This visualizes the heterogeneity of opinions of respondents sharing the same inflation point forecast.

Figure 1: Opinions and Expectations
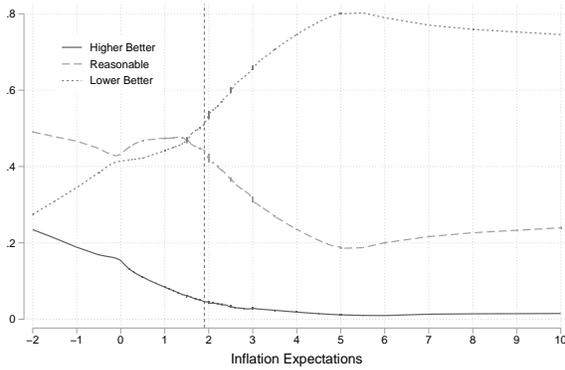
(a) Inflation Opinions and Inflation Expectations
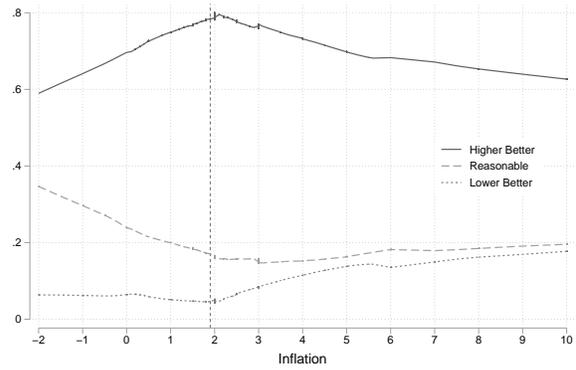
(b) Interest Rate Opinions and Inflation Expectations
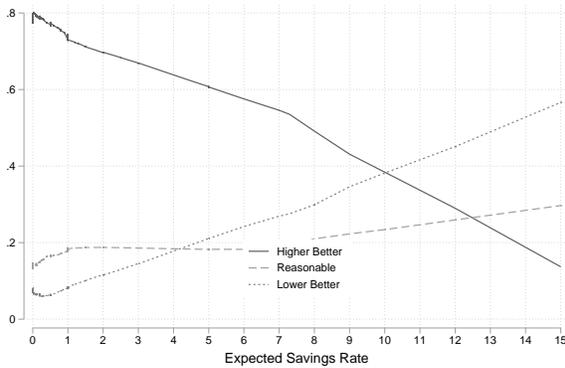
(c) Opinions and Savings Rate Expectations
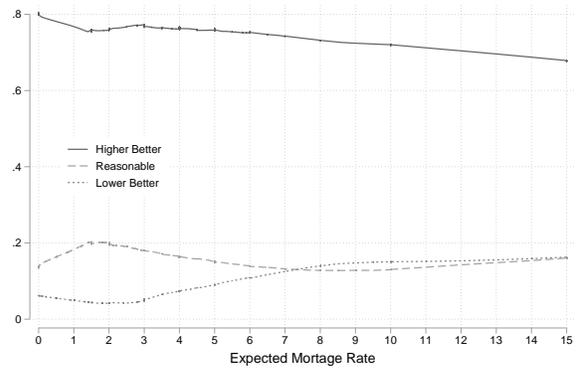
(d) Opinions and Mortgage Rate Expectations

Even when considering inflation expectations that are in line the ECB's mandate, i.e., lying between 1.5-2%, we observe that only about 50% of the respondents believe that this expected level of inflation is appropriate. From the remaining 50%, most people believe that this level of inflation is too high. This reflects a substantial degree of hidden heterogeneity within point expectations that would otherwise be considered as anchored at the inflation target, emphasizing the importance of considering these underlying opinions. For inflation expectations above the announced inflation target of the ECB, we observe that the share of people believing inflation will be reasonable substantially declines, while the share of households believing inflation will be too high sharply increases. Both movements are as one would expect. Strikingly, as we move to expected inflation levels below 1.5%, the share of respondents believing that these low expected inflation rates are appropriate remains high at about 50%, while the share of households believing inflation should be higher rises only up to levels around 20% and the share believing inflation should be lower remains high around 30%. Hence, there exists a substantial fraction of consumers who do not think that

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very low inflation or even deflation is harmful or who would prefer even lower inflation rates. This implies considerable lack of understanding of the economic problems related to missing the inflation target from below.

Figure 2(b) plots the opinions on future interest rates against the level of individual inflation expectations. We find a peak in the share of consumers preferring higher interest rates for those with inflation expectations around the inflation target, while the share thinking interest rates are appropriate increases when inflation expectations are very low. In Figures 2(d) and 2(c), we replicate Figure 2(a) for expectations on interest rates (saving rates and mortgage rates). The main message remains the same. There is a substantial and persistent heterogeneity of opinions conditional on having the same level expectations across the whole spectrum of expectations. This is what we term the 'hidden heterogeneity' in inflation and interest rate expectations. The shares remain relatively constant across levels of mortgage rate expectations, while the share of those preferring higher interest rates declines with higher savings interest rate expectations.

3.2 Identifying the Hidden Heterogeneity

In Figures 1 in the previous section, we show that there exists a large degree of 'hidden heterogeneity' in opinions about future inflation and interest rates for consumers sharing the same expectations on inflation and interest rates. This is even true when inflation expectations are "anchored", i.e., close to the announced inflation target. In this section, we aim to characterize this heterogeneity in opinions according to demographic characteristics as well as macroeconomic expectations/conditions.

All models estimate the likelihood of choosing either opinion category using probit models with population weights. The estimation output tables report marginal effects evaluated at the sample mean. For the full sample, we truncate quantitative point forecasts of inflation to lie in the range between -5% to +25%. Quantitative interest rate expectations are truncated to be lower than 25%. Models for inflation opinions with demographic characteristics are estimated using the first wave only when this question was included into the questionnaire. The second wave contains the questions regarding interest rate opinions as well as quantitative interest rate expectations. Therefore, we matched consumers in the first wave who answered questions on inflation expectations to their answers in the second wave and use the second wave for all models including either interest rate opinions or macroeconomic expectations. [1]

Table 2 shows the role of demographic characteristics on the likelihood of responding that inflation should be lower, is appropriate or should be higher, respectively. In first three columns we report the effects for the full range of quantitative inflation expectations. The second three tables use only the responses of those consumers who expect either deflation or very low inflation rates below 1.5% in the next 12 months. The third block shows effects for responses in the "inflation target zone", i.e., between 1.5% and 2%, while the last three columns use only high inflation expectations above 2%.

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[1]Given that there is only a gap of one month between those surveys the conditions should not have changed substantially.

In the full sample, consumers are more likely to think expected inflation is appropriate or should be higher if they are male, and less likely to say that inflation should be lower with rising age. Respondents with high income or university education are less likely to say that inflation should be lower and more likely to report that expected inflation is appropriate (or should be higher), while the reverse is true for respondents who are unemployed or out of the labor market. Interestingly, consumers who lived in the GDR prior to 1989 are also significantly more likely to think that inflation should be lower, and less likely to view expected inflation as appropriate. This is in line with recent findings in Goldfayn-Frank and Wohlfahrt (2019). Overall, it thus seems that the demographic groups who typically report higher inflation forecasts with lower forecast accuracy are also more likely to think that inflation rates should be lower.[2] This is corroborated by our results in Table A.3 in the appendix, which shows that consumers with higher inflation expectations are more likely to view expected inflation as too high, rather than appropriate or too low.

However, when we distinguish between different ranges of inflation expectations, the results in Table 2 suggest that most of the demographic heterogeneity in inflation opinions actually takes place within the 'inflation target zone' $1.5 \leq \pi^e \leq 2$, where inflation expectations are both relatively homogeneous and close to the official inflation target of the ECB. Thus, even when inflation expectations seem anchored, there is considerable underlying heterogeneity with respect to the opinions of consumers regarding these expectations: The differences in opinions across gender, income, education and for those having lived in Eastern Germany before 1989 are mostly significant only in the 'inflation target zone', where the marginal effects are often higher than for the overall sample. By contrast, only few demographic effects remain significant when inflation expectations lie below 1.5% or above 2%.

Next, in Table 3 we evaluate the heterogeneity across opinions on future interest rates. Overall, consumers in the second wave are more likely to think that interest rates should be higher, i.e. less likely to think interest rates are appropriate or should be lower, with rising age and in the higher income and education groups. Hence, those groups of the population who typically save more than average are also more likely to prefer higher interest rates. Again, we observe considerable heterogeneity in these demographic effects when restricting the range of inflation forecasts: The view that higher income groups who save more would generally prefer higher interest rates only holds for those consumers with relatively high inflation expectations above 2%. By contrast, those with inflation expectations in the 'inflation target zone' $1.5 \leq \pi^e \leq 2$ and higher income are more likely to state that interest rates should be lower and less likely to say they are appropriate. Finally, consumers with relatively low inflation expectations below 1.5% seem to prefer higher interest rates more when their income is low, rather than middle or high.

Finally, Tables A.3-A.4 in the appendix evaluate the heterogeneity in opinions on future inflation and interest rates across different levels of inflation and interest rate expectations, while controlling for demographic effects. With rising inflation expectations, consumers are more likely to view inflation as too high, and less likely to think it is appropriate or should be higher. Not surprisingly,

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[2]Inflation expectations are typically found to be higher/less accurate for females as well as low education and low income groups. This finding is highly robust across different time periods and different country surveys, see for instance, Jonung (1981); Bryan and Venkatu (2001); Pfajfar and Santoro (2009).

Table 2: Opinions about Future Inflation

	Full sample			$-5 \leq \pi^e < 1.5$			$1.5 \leq \pi^e \leq 2$			$2 < \pi^e \leq 25$		
	inf_lowbetter	inf_reason	inf_highbetter	inf_lowbetter	inf_reason	inf_highbetter	inf_lowbetter	inf_reason	inf_highbetter	inf_lowbetter	inf_reason	inf_highbetter
d_male	-0.086***	0.051*	0.039***	-0.061	-0.011	0.083**	-0.087**	0.044	0.051***	-0.037	0.031	0.007
	(0.027)	(0.027)	(0.012)	(0.067)	(0.069)	(0.039)	(0.042)	(0.042)	(0.020)	(0.038)	(0.037)	(0.012)
age	-0.003*	0.002	0.001	-0.005	0.005	-0.000	-0.003	0.002	0.001	-0.002	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)
inc_middle	-0.075	0.107	-0.025	0.329*	-0.181	-0.105	-0.265*	0.235*	0.279***	-0.075	0.102	-0.017
	(0.081)	(0.083)	(0.031)	(0.186)	(0.208)	(0.095)	(0.138)	(0.140)	(0.052)	(0.101)	(0.103)	(0.025)
inc_high	-0.163**	0.199**	-0.030	0.256	-0.096	-0.114	-0.340**	0.307**	0.280***	-0.136	0.178*	-0.032
	(0.081)	(0.083)	(0.032)	(0.187)	(0.210)	(0.094)	(0.138)	(0.140)	(0.053)	(0.102)	(0.105)	(0.025)
d_east1989	0.138***	-0.147***	0.006	0.044	-0.099	0.051	0.201***	-0.193***	-0.014	0.093*	-0.097*	0.001
	(0.036)	(0.035)	(0.014)	(0.087)	(0.090)	(0.043)	(0.051)	(0.052)	(0.022)	(0.050)	(0.050)	(0.015)
d_edu_real	-0.051	0.043	0.009	0.058	-0.066	0.017	-0.078	0.064	0.014	-0.041	0.040	0.002
	(0.034)	(0.033)	(0.016)	(0.080)	(0.081)	(0.054)	(0.051)	(0.052)	(0.020)	(0.047)	(0.046)	(0.016)
d_edu_abi	-0.075	0.063	0.014	-0.123	0.114	0.024	-0.151**	0.140**	0.010	0.050	-0.072	0.020
	(0.047)	(0.047)	(0.019)	(0.129)	(0.131)	(0.069)	(0.067)	(0.068)	(0.025)	(0.068)	(0.066)	(0.019)
d_edu_uni	-0.199***	0.158***	0.038**	-0.089	-0.002	0.090*	-0.290***	0.270***	0.017	-0.079	0.040	0.035*
	(0.038)	(0.038)	(0.016)	(0.091)	(0.093)	(0.050)	(0.057)	(0.057)	(0.021)	(0.059)	(0.058)	(0.018)
d_parttime	0.049	-0.040	-0.010	0.082	-0.046	-0.021	0.005	0.003	-0.021	0.018	-0.019	0.004
	(0.046)	(0.046)	(0.019)	(0.118)	(0.124)	(0.068)	(0.077)	(0.078)	(0.034)	(0.060)	(0.059)	(0.016)
d_noemploy	0.119**	-0.099*	-0.025**	0.179	-0.152	-0.050	0.049	-0.048	0.002	0.111*	-0.093	-0.017
	(0.052)	(0.052)	(0.012)	(0.123)	(0.130)	(0.037)	(0.079)	(0.081)	(0.013)	(0.066)	(0.063)	(0.011)
d_retired	-0.046	0.048	0.002	0.072	-0.053	-0.029	-0.019	0.036	-0.021	-0.063	0.064	0.001
	(0.058)	(0.057)	(0.014)	(0.145)	(0.149)	(0.054)	(0.087)	(0.089)	(0.020)	(0.074)	(0.071)	(0.014)
N	1517	1517	1517	267	267	267	670	670	670	580	580	580
χ^2	98.335	79.722	32.566	18.732	11.328	22.868	68.440	57.410	944.334	20.236	21.789	14.844
Pseudo R^2	0.054	0.045	0.054	0.051	0.033	0.134	0.088	0.073	0.074	0.027	0.030	0.061

Note: Bundesbank Online Pilot Survey on Consumer Expectations, first wave. Average marginal effects for the likelihood of reporting that inflation should be lower/is reasonable/should be higher are reported from estimations with population weights. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

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Table 3: Opinions about Future Interest Rates

| | Full sample | | | $-5 \leq \pi^e < 1.5$ | | | $1.5 \leq \pi^e \leq 2$ | | | $2 < \pi^e \leq 25$ | | |
	int_lowbetter	int_reason	int_highbetter	int_lowbetter	int_reason	int_highbetter	int_lowbetter	int_reason	int_highbetter	int_lowbetter	int_reason	int_highbetter
d_male	-0.021	0.028	-0.008	0.045	0.077	-0.124*	-0.019	0.014	0.005	-0.020	0.012	0.009
	(0.017)	(0.022)	(0.026)	(0.040)	(0.062)	(0.069)	(0.021)	(0.036)	(0.040)	(0.027)	(0.029)	(0.038)
age	-0.003***	0.001	0.003**	-0.002	0.001	0.002	-0.004***	0.001	0.004**	-0.003**	0.001	0.002
	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.004)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)
inc_middle	-0.077*	-0.004	0.114	0.064	1.298***	-0.359**	0.340***	-0.186**	0.145	-0.150**	0.043	0.172*
	(0.042)	(0.055)	(0.071)	(0.063)	(0.212)	(0.165)	(0.073)	(0.091)	(0.109)	(0.064)	(0.082)	(0.097)
inc_high	-0.113***	0.024	0.122*	-0.054	1.389***	-0.327**	0.331***	-0.162*	0.129	-0.187***	0.063	0.187*
	(0.042)	(0.056)	(0.071)	(0.061)	(0.222)	(0.167)	(0.072)	(0.092)	(0.110)	(0.064)	(0.085)	(0.096)
d_east1989	0.010	-0.042	0.032	-0.001	0.042	-0.048	-0.012	-0.073	0.084	0.013	-0.048	0.034
	(0.023)	(0.028)	(0.035)	(0.038)	(0.076)	(0.089)	(0.025)	(0.047)	(0.052)	(0.038)	(0.039)	(0.052)
d_edu_real	-0.008	-0.028	0.033	0.051	-0.019	-0.025	-0.020	0.003	0.009	-0.008	-0.054	0.055
	(0.020)	(0.025)	(0.031)	(0.050)	(0.069)	(0.083)	(0.027)	(0.040)	(0.046)	(0.032)	(0.035)	(0.045)
d_edu_abi	-0.088***	-0.093**	0.169***	0.058	-0.141	0.082	-0.088*	-0.126**	0.200***	-0.134**	-0.043	0.152**
	(0.032)	(0.037)	(0.044)	(0.050)	(0.108)	(0.114)	(0.047)	(0.061)	(0.069)	(0.055)	(0.049)	(0.066)
d_edu_uni	-0.043*	-0.054*	0.090**	0.040	-0.104	0.079	-0.058*	-0.055	0.102*	-0.029	-0.024	0.046
	(0.025)	(0.030)	(0.037)	(0.054)	(0.084)	(0.097)	(0.034)	(0.047)	(0.053)	(0.042)	(0.042)	(0.056)
d_parttime	-0.021	0.013	0.006	0.018	0.012	-0.043	0.019	-0.028	0.009	-0.082*	0.044	0.028
	(0.027)	(0.035)	(0.043)	(0.052)	(0.098)	(0.112)	(0.031)	(0.059)	(0.066)	(0.049)	(0.046)	(0.063)
d_noemploy	0.021	-0.020	-0.013	0.014	0.241	-0.248	0.020	-0.088	0.053	0.006	-0.013	-0.005
	(0.029)	(0.044)	(0.048)	(0.057)	(0.171)	(0.157)	(0.036)	(0.068)	(0.074)	(0.048)	(0.055)	(0.068)
d_retired	-0.024	-0.032	0.060	-0.022	-0.232	0.233	0.025	0.014	-0.034	-0.046	-0.045	0.095
	(0.033)	(0.046)	(0.053)	(0.071)	(0.189)	(0.183)	(0.038)	(0.074)	(0.079)	(0.055)	(0.059)	(0.074)
N	1617	1617	1617	211	211	211	665	665	665	741	741	741
χ^2	42.220	18.328	35.483	16.040	368.129	11.610	234.724	16.782	21.099	27.702	11.423	23.095
Pseudo R^2	0.077	0.015	0.026	0.153	0.067	0.055	0.152	0.031	0.039	0.088	0.021	0.035

Note: Bundesbank Online Pilot Survey on Consumer Expectations, second wave. Average marginal effects for the likelihood of reporting that interest rates should be lower/is reasonable/should be higher are reported from estimations with population weights. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

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this effect is extinguished by restricting inflation expectations in the 'inflation target zone' between 1.5% and 2%. The heterogeneity among inflation opinions in this range is thus not driven by the level of inflation expectations as already indicated in Figure 2(a). Moreover, there is some evidence that consumers with higher mortgage rate expectations are more likely to think inflation should be lower and less likely to think it is appropriate or should be higher. This effect remains also in the 'inflation target zone.'

Evaluating interest rate opinions in Table A.4 in appendix, we find no effects of inflation expectations. Instead, as expected, consumers are more likely to prefer lower interest rates, and less likely to think they should be higher, if they have higher savings or mortgage rate expectations. This relation does not differ significantly between the full sample and the 'inflation target zone,' suggesting that inflation and interest rate opinions are formed somewhat independently.

3.3 Implications for Spending on Durable Goods and for Saving

So far we have identified a new dimension of heterogeneity of inflation expectations which is related to the perceptions of whether inflation and interest rates are expected to be at an appropriate level. This 'hidden heterogeneity' is present even for similar levels of inflation expectations. In this section, we assess whether this hidden heterogeneity also has implications for consumption and savings decisions. One nice feature of our dataset is that it asks for both the level of expenditures/saving in € in the past month and whether households intend to spend/save more/less/about the same over the next 12 months. The survey asks for the € amount of spending on durable goods, consumer goods, clothes and shoes, leisure activities, transport costs, services, vacation, housing costs, and financial reserves (savings). We will focus on a selection of expenditures in this section.

Table 4 shows the determinants of the log of spending on durable goods as well as the likelihood to spend more in the next 12 months. In all estimations, we control for demographic characteristics, where income plays a crucial role (these results are omitted, but available on request). We additionally control for (perceived) real interest rates on savings, defined as $r^e_{savings} = i^e_{savings} - \pi^e$ and for planned spending in the models for current spending (or current spending in the models for planned spending).[3]

Results for the overall sample show that our interest rate and inflation attitudes have a relatively limited role in explaining current spending on durables, with the exception of some evidence that those households who answer that it would be better to have lower interest rates tend to spend more. Nevertheless, opinions on inflation and interest rates add explanatory power to the model compared to Euler equation models with only planned spending and (perceived) real rates (and demographic controls). Notably adding opinions to the model in the full sample, increases the adjusted R^2 substantially from 0.022 to 0.041. Hence, albeit the rather low level of explanatory the marginal contribution of opinions on top of all the control variables is quite substantial. Expectations of the real interest rate do not significantly affect durable good spending for the overall population. When

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[3]Estimations with nominal interest rates and inflation expectations entered as separate variables are available upon request. When entering both variables separately, it emerges that the effect of perceived real interest rates is mainly driven by consumers' inflation expectations.

Table 4: Current and Planned Spending on Durables

	Current Spending (in € for the previous month)								Planned Spending (prob. to spend more, next 12 months)					
	Full sample				$1.5 \leq \pi^e \leq 2$				Full sample			$1.5 \leq \pi^e \leq 2$		
c_t^{dur}	0.123 (0.110)		0.212** (0.103)		-0.029 (0.145)		0.062 (0.145)		0.015 (0.014)		0.027** (0.013)	-0.005 (0.024)		0.011 (0.024)
$c_t^{dur,e}$		0.036 (0.075)		0.209** (0.103)		-0.004 (0.120)		0.060 (0.144)		0.004 (0.009)			-0.000 (0.016)	
$r_{savings}^e$	-0.012 (0.022)	0.002 (0.012)	-0.030 (0.036)		-0.036 (0.024)	-0.036* (0.022)	-0.048* (0.026)	-0.047*** (0.018)	0.001 (0.006)	0.003 (0.004)	0.001 (0.006)	-0.007 (0.009)	0.001 (0.010)	-0.007 (0.008)
$d\_inf\_lowbetter$	-0.083 (0.149)	-0.062 (0.145)	-0.075 (0.207)		-0.183 (0.219)	-0.227 (0.213)	0.014 (0.420)		-0.047 (0.034)		-0.042 (0.033)	-0.057 (0.055)		-0.030 (0.051)
$d\_inf\_highbetter$	-0.263 (0.370)	-0.260 (0.347)	-0.298 (0.679)		-0.875* (0.459)	-0.842* (0.455)	-1.291 (1.030)		-0.006 (0.060)		-0.003 (0.058)	0.060 (0.080)		0.063 (0.079)
$d\_int\_lowbetter$	0.181 (0.245)	0.681** (0.321)	0.656* (0.369)			0.593 (0.417)	1.045** (0.495)	0.250 (0.447)		-0.137** (0.059)	-0.273*** (0.080)		-0.311** (0.123)	-0.596*** (0.194)
$d\_int\_highbetter$	0.146 (0.127)	-0.144 (0.171)	-0.091 (0.190)			0.115 (0.186)	-0.297 (0.209)	-0.286 (0.262)		-0.035 (0.031)	-0.043 (0.044)		-0.100* (0.055)	-0.066 (0.081)
$r_{savings}^e * d\_inf\_highbetter$			-0.026 (0.369)				-0.279 (0.579)							
$r_{savings}^e * d\_inf\_lowbetter$			-0.005 (0.057)				0.230 (0.283)							
$r_{savings}^e * d\_int\_highbetter$			0.029 (0.046)				0.000 (0.130)							
$r_{savings}^e * d\_int\_lowbetter$			-0.010 (0.078)				-0.986*** (0.279)							
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	380	786	379	379	163	317	163	163	380	786	379	163	317	163
Adj. R²	0.015	0.040	0.041	0.032	0.076	0.079	0.123	0.125						
χ^2									22.137	29.978	36.036	9.514	18.738	16.691
Pseudo R^2									0.032	0.028	0.057	0.021	0.047	0.070

Note: Bundesbank Online Pilot Survey on Consumer Expectations, second wave. OLS estimations on log truncated spending with population weights. Average marginal effects for the likelihood of higher spending also from estimations with population weights. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

we look only at those households who have expectations within the ECB target range, we see that the coefficient on the perceived real interest rate becomes significantly negative, which is in line with the consumption Euler equation. This means that when households perceive higher real rates they postpone part of their spending.

For the range of inflation expectations in line with the ECB's objective attitudes also matter for current spending on durables: Those who believe that interest rates should be lower, are de facto acting as if *current* (nominal) interest rates—and thus real interest rates—are lower: They have significantly higher durable goods spending than the reference group who thinks interest rates are appropriate. Somewhat more surprisingly, also households who think that higher interest rates would be better have higher durable goods spending, but this effect goes away after controlling for inflation attitudes.In addition, the effect of thinking interest rates should be lower interacts with consumers' perceived real interest rate: We see that those consumers who think that lower interest rates would be better have a much stronger negative real interest rate elasticity than other households. One potential interpretation of this asymmetry is that consumers are more sensitive to decreases in the real interest rate than to increases. As interest rates often decrease during contractions, this mechanism is consistent with what has been shown in Yogo (2008), Rosenblatt-Wisch (2008), and consistent with the model of Santoro et al. (2014). Yogo (2008) shows that during contractions changes in the real interest rate have a stronger impact on consumption, as the elasticity of intertemporal substitution between current and future consumption increases. Note, however, that the group of consumers who would prefer lower interest rates in the future in our sample is relatively small compared to the group preferring higher interest rates. In addition to the effect of preferring lower interest rates, we also find a marginally significant negative effect of preferring higher inflation on the level of current durable spending. However, the effect becomes insignificant when adding interaction effects with perceived real rates.

We further check whether there are consistent effects of attitudes also on the likelihood to spend more on durable goods in the next 12 months. The results are reported in the right-hand-side of Table 4. While the perceived real interest rate is not significant in these regressions, the effects of attitudes are surprisingly consistent with the results on current consumption. We can see that for both the overall group and for the group with inflation expectations consistent with the ECB's target the effect of preferring lower interest rates is now negative, implying that these households are less likely to increase their spending on durable goods in the next 12 months. This is again consistent with the Euler equation, suggesting that the intertemporal substitution effect is at work, where households have opted to spend more today and less tomorrow. The significant effect on the likelihood to spend more on durable goods for households who think higher interest rates would be

Table 5: Current and Planned Saving

	Current Spending (in €; for the previous month)								Planned Spending (prob. to spend more, next 12 months)					
	Full sample				$1.5 \leq \pi^e \leq 2$				Full sample			$1.5 \leq \pi^e \leq 2$		
$saving_t$	0.219*** (0.082)				0.330*** (0.116)				0.061** (0.025)			0.089*** (0.031)		
$saving_t^e$		0.257*** (0.055)	0.216** (0.084)	0.208** (0.084)		0.305*** (0.087)	0.331*** (0.117)	0.317*** (0.121)		0.072*** (0.016)	0.060** (0.025)		0.073*** (0.021)	0.090*** (0.031)
$r_{savings}^e$	-0.001 (0.012)	-0.001 (0.008)	0.000 (0.012)	-0.013 (0.024)	-0.046 (0.063)	-0.035** (0.016)	-0.037 (0.065)	-0.198 (0.276)	0.008 (0.007)	-0.001 (0.004)	0.008 (0.006)	0.016 (0.031)	-0.008 (0.007)	0.012 (0.032)
d_inf_lowbetter	-0.282*** (0.085)		-0.285*** (0.087)	-0.197* (0.106)	-0.195 (0.119)		-0.196* (0.119)	-0.221 (0.229)	-0.010 (0.037)		-0.003 (0.037)	0.008 (0.055)		0.009 (0.055)
d_inf_highbetter	0.094 (0.201)		0.089 (0.202)	0.226 (0.486)	-0.045 (0.327)		-0.058 (0.331)	-0.317 (0.669)	-0.043 (0.079)		-0.043 (0.078)	0.041 (0.150)		0.045 (0.148)
d_int_lowbetter	-0.017 (0.128)		-0.050 (0.160)	-0.092 (0.173)	-0.079 (0.232)		-0.110 (0.255)	-0.075 (0.473)	-0.069 (0.058)		-0.190** (0.079)			0.263*** (0.099)
d_int_highbetter	0.006 (0.077)		0.060 (0.106)	0.039 (0.126)	0.139 (0.120)		0.077 (0.142)	0.361 (0.435)	0.047 (0.034)		-0.031 (0.043)			0.088* (0.052)
$r_{sav}^e * d\_inf\_highbetter$				0.088 (0.244)				-0.172 (0.454)						
$r_{sav}^e * d\_inf\_lowbetter$				0.045 (0.028)				-0.013 (0.146)						
$r_{sav}^e * d\_int\_highbetter$				-0.010 (0.033)				0.198 (0.284)						
$r_{sav}^e * d\_int\_lowbetter$				-0.039 (0.032)				-0.168 (0.398)						
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	610	1220	609	609	264	507	264	264	610	1220	609	264	507	264
Adj. R²	0.163	0.142	0.162	0.163	0.236	0.171	0.232	0.223						
χ^2									75.093	86.224	77.524	53.661	53.994	55.484
Pseudo R^2									0.084	0.051	0.090	0.123	0.075	0.124

Note: Bundesbank Online Pilot Survey on Consumer Expectations, second wave. OLS estimations on log truncated spending with population weights. Average marginal effects for the likelihood of higher spending also from estimations with population weights. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

more appropriate again disappears when controlling for inflation attitudes.[4,5] To further analyze the heterogeneity of durable good spending we split the sample between homeowners and renters. The results are presented in Tables A.1-A.2 in the appendix. As these are smaller samples, we rely only on the (remaining) full sample. Homeowners' current spending – contrary to the overall sample – does not depend on their planned consumption and is not correlated with attitudes towards lower interest rates. The effect of the perceived real rate on current durable spending becomes significantly negative when accounting for interaction effects with opinions, something that we have only observed for those households that have inflation expectations within the 1.5-2% range before. In addition, we find that this effect goes away for those households who think higher interest rates are better and is significantly stronger for those households who think lower interest rates are better. Regarding durable spending of renters, we find the same positive/negative effect of preferring lower interest rates on current/planned durable spending as in the overall sample, but none of the interaction effects with perceived real rates is significant. In addition, it immediately stands out that we do not find any effects through the perceived real interest rate, contrary to both the homeowners and the overall sample. Interestingly, the results in Tables A.1-A.2 reveal opposite effects of preferring lower inflation on current durable spending of homeowners versus renters: While we observe a significant negative effect of preferring lower inflation on both current and planned durable spending of homeowners, the effect becomes significantly positive for current durable spending of renters. The asymmetric effect may explain the insignificant effect we find in the full sample. If preferring lower inflation implies that consumers act *as if* inflation was lower in the future, we would expect a negative effect on current spending. This would imply that the effect for homeowners is consistent with the theory, while the effect for renters is inconsistent.

In addition, we evaluate implications of the hidden heterogeneity in expectations on current and planned savings. Results are reported in Table 5.[6] The real expected savings rate seems to have little impact on the € amount of savings. We get an effect from attitudes mostly for the overall sample: Thinking that lower inflation would be better is negatively correlated with the amount of current savings. This is in contrast with the consumption Euler equation: Theoretically, if one acts *as if* inflation were lower in the future, this should reduce current spending and increase current

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[4]We further evaluate implications of inflation and interest rate attitudes on spending on consumption goods and on housing. The results show that attitudes affect current consumption spending, but only in the full sample. Here we find positive level and interaction effects of preferring higher inflation, lower interest rates as well as higher interest rates. Hence, the attitudes may reduce the negative impact of perceived real rates on current spending, which becomes insignificant. There are little effects on planned spending on consumption goods. Moreover, we find a significantly positive effect of preferring lower inflation on current, but not planned, housing expenditures. In line with our results on durable spending, we also report that preferring lower interest rates is negatively related to the level of spending on housing. Again, there are little effects of opinions on planned housing expenditures. The results are shown in the appendix in Tables A.5-A.6, with interaction effects for the non-linear models on planned spending in Figures A.3-A.4. Here, we find that consumers who would think that lower interest rates in the future would be better react more strongly to their perceived real rate when planning housing expenditures.

[5]We further estimate interaction effects between inflation and interest rate opinions and consumers' perceived real interest rate on the likelihood of higher planned spending on durables. Due to the non-linearity of the model, the interaction effects cannot be interpreted directly and are therefore shown graphically in Figure A.1 in the appendix. However, none of the interaction effects are significant.

[6]As before, the demographic controls are included (although not reported here). As expected, income has a strong effect, but also age (surprisingly) tends to be significant. Older and richer households save more. Furthermore, complementary to the results on consumption goods spending, males tend to save significantly more than females.

savings. The likelihood to increase savings in the future (reported in the right-hand-side of Table 5) is largely unaffected by the expected real interest rate and attitudes regarding inflation and interest rates. The only determinant that consistently enters significantly is the amount of current savings. Those who have relatively high savings today are more likely to increase savings in the future. For the overall sample, only the attitude that lower interest rates would be better decreases the likelihood to increase future savings. However, as shown in Figure A.2 in the appendix, the marginal effect of perceived real interest rates on planned savings becomes significantly negative if the consumer thinks higher inflation would be better.

4   Conclusion

In this paper, we show that attitudes towards future inflation and interest rates matter for inflation expectations and have implications for consumption spending and saving decisions. We demonstrate this 'hidden heterogeneity' of inflation expectations using a new survey dataset from the Bundesbank Online Pilot Survey of Consumer Expectations, fielded on the German population in 2019. The majority of consumers in our sample thinks inflation should be lower and interest rates should be higher. Remarkably, even if inflation expectations are around the official inflation target of the ECB, still 46% of consumers in our sample think inflation should be lower, and this range remains high at around 30% even when consumers expect deflation in the next year. We document a similar 'hidden heterogeneity' also for opinions about future interest rates. Overall, observing inflation point forecasts close to the target does not seem to be any reliable indicator for thinking that either expected inflation or expected interest rates will be appropriate.

We demonstrate that the observed 'hidden heterogeneity' in inflation and interest rate expectations is related to socio-demographic characteristics. In particular, for consumers with very similar point forecasts of inflation, differences across gender, income and education are an important driver of diverging views on future inflation. Moreover, we show that the observed heterogeneity in attitudes may have some implications for current and future planned spending and saving decisions, in addition to effects from the level of perceived real rates and from demographic control variables.

Information about consumers' opinions on future interest rates and inflation expectations together with their level expectations is of great importance for monetary policy makers, as it gives additional insights relevant to the effectiveness of the transmission channel of monetary policy. Being able to disentangle attitudes linked to specific expectations allows the central bank to address those concerns more directly and more specifically in their communication and consequently improve monetary policy efficacy.

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Appendix

Table A.1: Current and Planned Spending on Durables for Homeowners

	Current Spending Full sample				Planned Spending Full sample		
c_t^{dur}					0.000	-0.002	0.000
					(0.015)	(0.012)	(0.015)
$c_t^{dur,e}$	-0.001	-0.013	0.001	-0.005			
	(0.112)	(0.091)	(0.113)	(0.115)			
$r_{savings}^e$	-0.020	-0.003	-0.015	-0.150*	-0.002	0.003	-0.004
	(0.029)	(0.014)	(0.025)	(0.086)	(0.008)	(0.005)	(0.008)
$d\_inf\_lowbetter$	-0.446***		-0.421***	-0.343	-0.081**		-0.080**
	(0.154)		(0.150)	(0.228)	(0.038)		(0.037)
$d\_inf\_highbetter$	-0.837		-0.853*	-1.208	-0.077		-0.083
	(0.534)		(0.516)	(1.757)	(0.064)		(0.066)
$d\_int\_lowbetter$		-0.270	0.423	-0.586		-0.081	-0.142
		(0.341)	(0.464)	(0.385)		(0.085)	(0.095)
$d\_int\_highbetter$		-0.064	-0.273	0.004		-0.040	-0.046
		(0.140)	(0.176)	(0.276)		(0.035)	(0.047)
$r_{savings}^e * d\_inf\_highbetter$				-0.226			
				(0.841)			
$r_{savings}^e * d\_inf\_lowbetter$				0.056			
				(0.071)			
$r_{savings}^e * d\_int\_highbetter$				0.155*			
				(0.087)			
$r_{savings}^e * d\_int\_lowbetter$				-0.180**			
				(0.077)			
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	243	504	243	243	243	504	243
Adj. R^2	0.064	0.029	0.076	0.095			
χ^2					31.070	26.290	33.197
Pseudo R^2					0.068	0.039	0.074

Note: Bundesbank Online Pilot Survey on Consumer Expectations, second wave. OLS estimations on log truncated spending with population weights. Average marginal effects for the likelihood of higher spending also from estimations with population weights. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.2: Current and Planned Spending on Durables for Renters

	Current Spending Full sample				Planned Spending Full sample		
c_t^{dur}					0.015	0.006	0.043*
					(0.025)	(0.015)	(0.024)
$c_t^{dur,e}$	0.152	0.067	0.417*	0.429			
	(0.252)	(0.141)	(0.247)	(0.259)			
$r_{savings}^{e}$	0.033	-0.002	0.001	0.517	-0.007	-0.007	-0.001
	(0.059)	(0.030)	(0.058)	(0.460)	(0.013)	(0.007)	(0.013)
d_inf_lowbetter	0.674**		0.672**	0.804	-0.098		-0.097*
	(0.310)		(0.298)	(0.491)	(0.066)		(0.059)
d_inf_highbetter	0.544		0.537	0.964	-0.070		-0.067
	(0.560)		(0.547)	(0.588)	(0.093)		(0.079)
d_int_lowbetter		1.043***	1.424***	0.171		-0.233**	-0.423***
		(0.373)	(0.539)	(1.106)		(0.093)	(0.132)
d_int_highbetter		0.766***	0.414	-1.140		-0.046	-0.129
		(0.254)	(0.444)	(1.029)		(0.067)	(0.093)
$r_{savings}^{e} * d\_inf\_highbetter$				0.262			
				(0.421)			
$r_{savings}^{e} * d\_inf\_lowbetter$				0.050			
				(0.192)			
$r_{savings}^{e} * d\_int\_highbetter$				-0.643			
				(0.460)			
$r_{savings}^{e} * d\_int\_lowbetter$				-0.471			
				(0.468)			
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	115	244	114	114	115	244	114
Adj. R^2	0.041	0.074	0.126	0.130			
χ^2					21.222	20.124	39.555
Pseudo R^2					0.090	0.042	0.160

Note: Bundesbank Online Pilot Survey on Consumer Expectations, second wave. OLS estimations on log truncated spending with population weights. Average marginal effects for the likelihood of higher spending also from estimations with population weights. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.3: Opinions about Future Inflation and Macro Expectations

	Full sample			1.5 ≤ π^e ≤ 2		
	inf_lowbetter	inf_reason	inf_highbetter	inf_lowbetter	inf_reason	inf_highbetter
π^e	0.019**	-0.015**	-0.012***	0.112	-0.087	-0.029
	(0.008)	(0.008)	(0.005)	(0.138)	(0.138)	(0.050)
$i^e_{savings}$	-0.025**	0.027**	-0.014	-0.023	0.026	-0.008
	(0.011)	(0.011)	(0.011)	(0.019)	(0.019)	(0.022)
$i^e_{mortgage}$	0.018***	-0.015***	-0.004	0.014*	-0.009	-0.009*
	(0.005)	(0.005)	(0.003)	(0.008)	(0.008)	(0.005)
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	867	867	867	378	378	378
χ^2	34.275	25.258	31.168	13.081	7.587	27.202
Pseudo R^2	0.039	0.030	0.112	0.029	0.016	0.093

Note: Bundesbank Online Pilot Survey on Consumer Expectations, second wave. Average marginal effects for the likelihood of reporting that inflation should be lower/is reasonable/should be higher are reported from estimations with population weights. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.4: Opinions about Future Interest Rates and Macro Expectations

	Full sample			$1.5 \leq \pi^e \leq 2$		
	int_lowbetter	int_reason	int_highbetter	int_lowbetter	int_reason	int_highbetter
π^e	0.004	-0.005	0.001	0.046	0.009	-0.020
	(0.002)	(0.004)	(0.004)	(0.062)	(0.088)	(0.096)
$i^e_{savings}$	0.006*	0.015***	-0.033***	0.002	0.024***	-0.051***
	(0.003)	(0.006)	(0.007)	(0.004)	(0.008)	(0.018)
$i^e_{mortgage}$	0.008***	-0.004	-0.007**	0.007***	-0.004	-0.007
	(0.002)	(0.003)	(0.003)	(0.002)	(0.005)	(0.005)
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	1772	1772	1772	732	732	732
χ^2	82.870	18.265	62.278	38.231	16.066	27.841
Pseudo R^2	0.106	0.016	0.044	0.194	0.025	0.052

Note: Bundesbank Online Pilot Survey on Consumer Expectations, second wave. Average marginal effects for the likelihood of reporting that interest rates should be lower/is reasonable/should be higher are reported from estimations with population weights. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.5: Current and Planned Spending on Consumption Goods

	Current Spending (in € for the previous month)								Planned Spending (prob. to spend more, next 12 months)					
	Full sample				$1.5 \leq \pi^e \leq 2$				Full sample			$1.5 \leq \pi^e \leq 2$		
c_t^{cons}	0.001 (0.078)	0.065 (0.058)	0.014 (0.077)	0.007 (0.078)	0.035 (0.105)	0.083 (0.083)	0.038 (0.105)	0.036 (0.107)	-0.000 (0.017)	0.012 (0.010)	0.003 (0.016)	0.006 (0.026)	0.015 (0.016)	0.006 (0.025)
$c_t^{cons,e}$	-0.016 (0.012)	-0.009 (0.008)	-0.014 (0.011)	-0.053 (0.035)	0.010 (0.014)	-0.037* (0.019)	0.010 (0.014)	0.006 (0.010)	-0.005 (0.005)	-0.001 (0.003)	-0.006 (0.005)	-0.023*** (0.009)	-0.007 (0.005)	-0.023*** (0.008)
$r_{savings}^e$	-0.089 (0.065)	-0.101 (0.065)	-0.128* (0.076)		-0.079 (0.079)		-0.085 (0.079)	-0.185 (0.155)	-0.023 (0.022)		-0.018 (0.022)	-0.017 (0.036)		-0.015 (0.036)
d_inf_lowbetter														
d_inf_highbetter	0.175* (0.103)	0.171* (0.104)	0.377*** (0.133)		-0.019 (0.134)		-0.018 (0.135)	0.049 (0.196)	-0.025 (0.043)		-0.022 (0.042)	-0.027 (0.049)		-0.027 (0.049)
d_int_lowbetter	0.047 (0.098)	0.202 (0.127)	0.282** (0.142)			-0.018 (0.151)	0.104 (0.222)	-0.002 (0.211)		-0.046 (0.031)	-0.128*** (0.043)		-0.066 (0.044)	-0.048 (0.041)
d_int_highbetter	-0.032 (0.058)	0.117 (0.079)	0.212** (0.094)			-0.083 (0.074)	0.042 (0.094)	0.108 (0.100)		-0.013 (0.017)	-0.030 (0.023)		0.009 (0.023)	-0.015 (0.031)
$r_{savings}^e$ * d_inf_highbetter				0.151* (0.081)				0.047 (0.161)						
$r_{savings}^e$ * d_inf_lowbetter				-0.010 (0.017)				-0.069 (0.097)						
$r_{savings}^e$ * d_int_highbetter				0.057*** (0.028)				0.049 (0.035)						
$r_{savings}^e$ * d_int_lowbetter				0.055* (0.030)				-0.135 (0.117)						
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	768	1561	767	767	329	639	328	328	768	1561	767	329	639	328
Adj. R²	0.104	0.133	0.107	0.116	0.126	0.146	0.121	0.114						
χ^2									24.801	41.321	30.865	22.625	17.584	22.985
Pseudo R^2									0.042	0.036	0.054	0.066	0.036	0.068

Note: Bundesbank Online Pilot Survey on Consumer Expectations, second wave. OLS estimations on log truncated spending with population weights. Average marginal effects for the likelihood of higher spending also from estimations with population weights. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.6: Current and Planned Spending on Housing

	Current Spending (in € for the previous month)								Planned Spending (prob. to spend more, next 12 months)					
	Full sample				$1.5 \leq \pi^e \leq 2$				Full sample			$1.5 \leq \pi^e \leq 2$		
c_t^{house}	0.086 (0.063)	0.043 (0.043)	0.091 (0.064)	0.096 (0.063)	0.093 (0.094)	0.093 (0.061)	0.097 (0.094)	0.098 (0.094)						
$c_t^{house,e}$									0.028 (0.020)	0.014 (0.013)	0.032 (0.021)	0.037 (0.036)	0.029 (0.019)	0.039 (0.036)
$r_{savings}^e$	0.021** (0.011)	0.001 (0.007)	0.021** (0.010)	0.002 (0.018)	0.015 (0.014)	-0.035 (0.023)	0.009 (0.015)	0.007 (0.009)	-0.006 (0.006)	-0.001 (0.004)	-0.006 (0.006)	-0.008 (0.010)	-0.018** (0.008)	-0.007 (0.010)
d_inf_lowbetter	0.183*** (0.061)		0.195*** (0.063)	0.187** (0.075)	0.225** (0.089)		0.224** (0.091)	0.208 (0.144)	-0.003 (0.026)		-0.002 (0.026)	0.021 (0.048)		0.024 (0.049)
d_inf_highbetter	0.161 (0.118)		0.169 (0.115)	0.076 (0.209)	0.023 (0.166)		0.037 (0.161)	-0.163 (0.375)	-0.025 (0.066)		-0.026 (0.066)	-0.106 (0.091)		-0.109 (0.092)
d_int_lowbetter		0.029 (0.085)	0.047 (0.136)	0.011 (0.134)		-0.168 (0.145)	-0.051 (0.189)	-0.125 (0.221)		-0.053 (0.037)	-0.086* (0.051)		-0.088 (0.070)	-0.027 (0.078)
d_int_highbetter		-0.119** (0.052)	-0.101 (0.068)	-0.030 (0.084)		-0.202*** (0.070)	-0.170* (0.091)	-0.131 (0.115)		0.019 (0.024)	0.029 (0.033)		0.006 (0.037)	0.024 (0.053)
$r_{savings}^e * d\_inf\_highbetter$				-0.059 (0.115)				-0.135 (0.205)						
$r_{savings}^e * d\_inf\_lowbetter$				-0.003 (0.023)				-0.010 (0.089)						
$r_{savings}^e * d\_int\_highbetter$				0.036 (0.022)				0.024 (0.054)						
$r_{savings}^e * d\_int\_lowbetter$				-0.000 (0.028)				-0.089 (0.158)						
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	736	1503	734	734	322	619	321	321	736	1503	734	322	619	321
Adj. R²	0.112	0.067	0.121	0.124	0.122	0.069	0.123	0.113						
χ²									11.971	35.100	19.448	12.590	32.253	13.231
Pseudo R²									0.018	0.020	0.025	0.031	0.039	0.033

Note: Bundesbank Online Pilot Survey on Consumer Expectations, second wave. OLS estimations on log truncated spending with population weights. Average marginal effects for the likelihood of higher spending also from estimations with population weights. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure A.1: Planned Spending on Durables – Interaction Effects of Real Interest Rate Expectations and Opinions
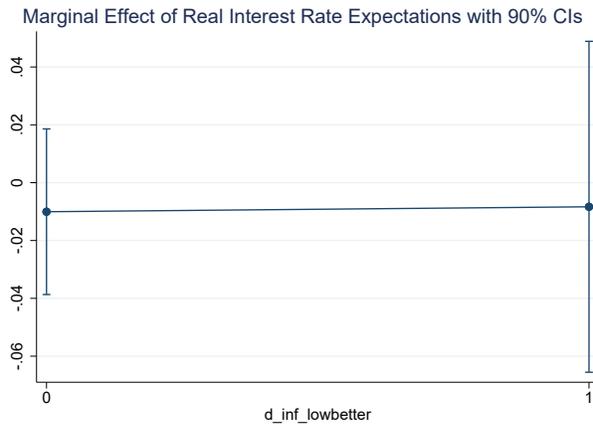
(a) Lower Inflation Would Be Better
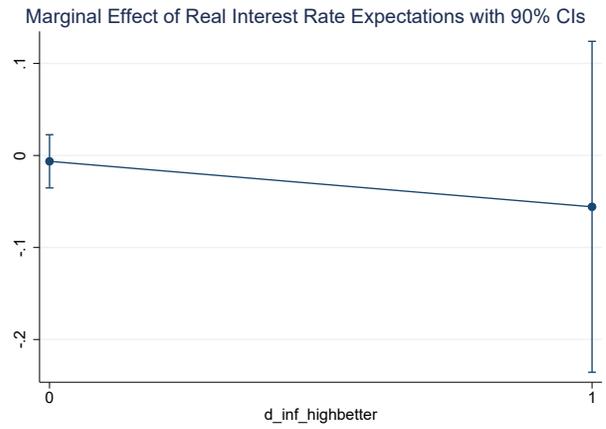
(b) Higher Inflation Would Be Better
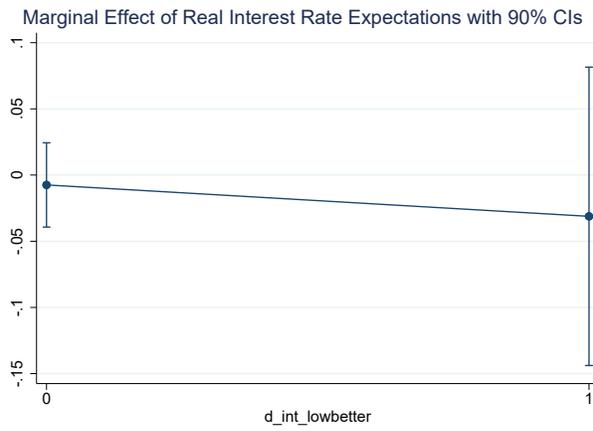
(c) Lower Interest Rates Would Be Better
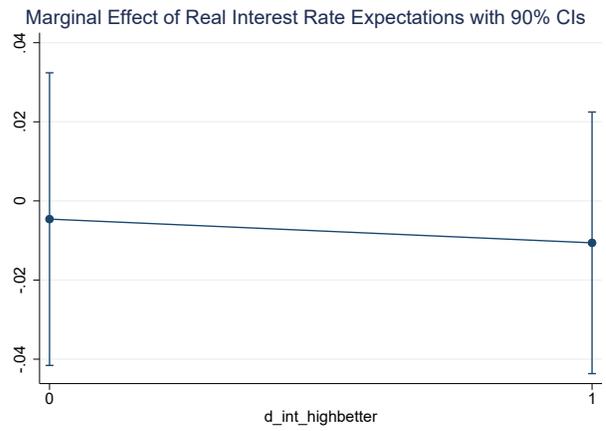
(d) Higher Interest Rates Would Be Better

Figure A.2: Planned Saving – Interaction Effects of Real Interest Rate Expectations and Opinions
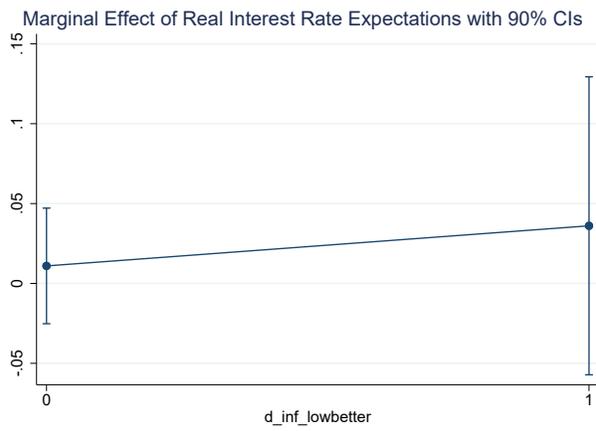
(a) Lower Inflation Would Be Better
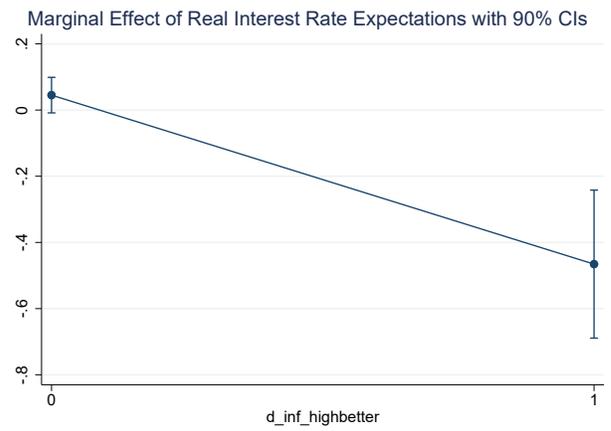
(b) Higher Inflation Would Be Better
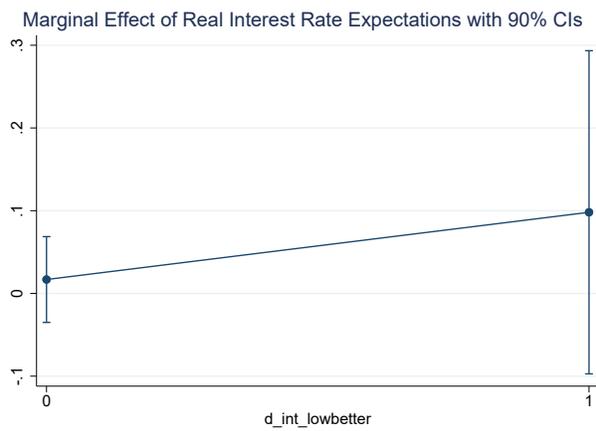
(c) Lower Interest Rates Would Be Better
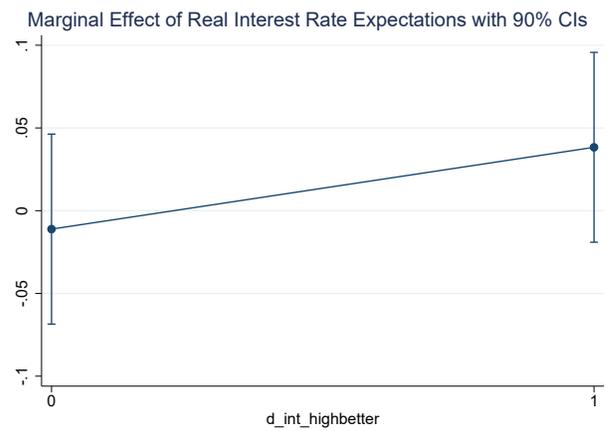
(d) Higher Interest Rates Would Be Better

Figure A.3: Planned Spending on Consumption Goods – Interaction Effects of Real Interest Rate Expectations and Opinions
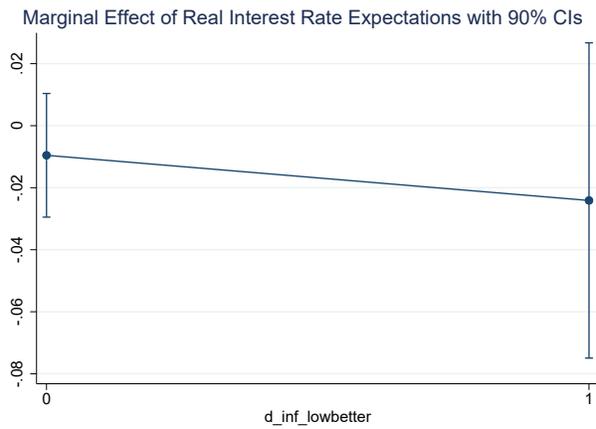
(a) Lower Inflation Would Be Better
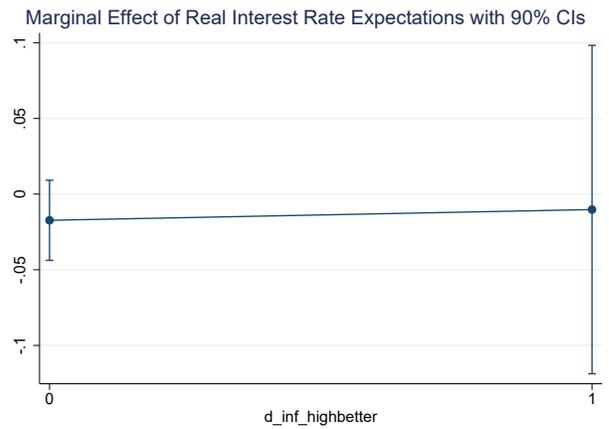
(b) Higher Inflation Would Be Better
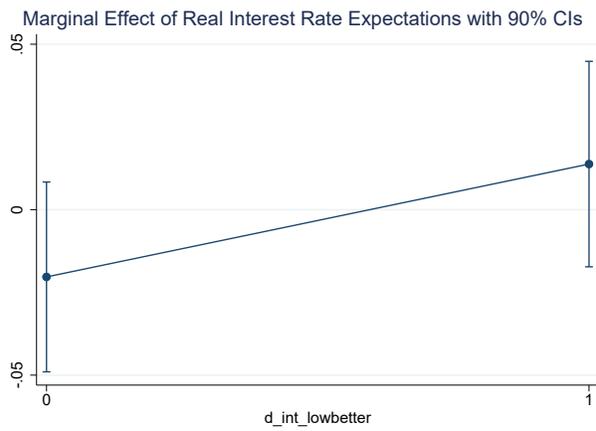
(c) Lower Interest Rates Would Be Better
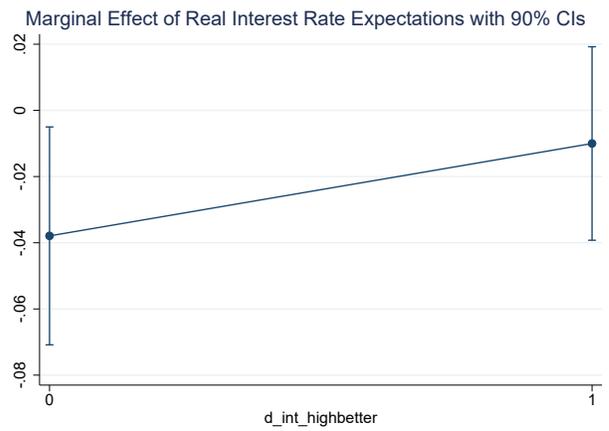
(d) Higher Interest Rates Would Be Better

Figure A.4: Planned Spending on Housing – Interaction Effects of Real Interest Rate Expectations and Opinions

(a) Lower Inflation Would Be Better

(b) Higher Inflation Would Be Better

(c) Lower Interest Rates Would Be Better

(d) Higher Interest Rates Would Be Better