

The Hidden Heterogeneity of Inflation Expectations and its Implications

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The views expressed in this paper are those of the authors and do not necessarily
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Introduction

- Inflation and interest rate expectations exhibit large heterogeneity in levels \Rightarrow matters for consumption/saving decisions and CB communication
- We document a new dimension of heterogeneity of inflation expectations:
 - ▶ German households with the **same inflation expectations** very differently assess whether the expected level of inflation is **appropriate or too high/too low**
 - ▶ Similar results for differences in opinions on expected interest rates
- This has implications for:
 - ▶ Perception of monetary policy
 - ▶ Spending and saving plans
 - ▶ Ultimately: new dimension for the definition of “anchored expectations”

This paper

- Use new data from the Bundesbank Online Pilot Survey on Consumer Expectations, fielded in April-June, 2019
 - Add questions, asking for
 - ① **Opinions** on expected inflation and expected interest rates (appropriate or too high/too low)
 - ② **Reasons** for why consumers think inflation/interest rates will be too high/too low
- ⇒ Households with the same inflation expectations can have very different perceptions of the appropriate level of inflation and interest rates, even when inflation expectations are “anchored” within the ECB’s target inflation zone (between 1.5% and 2%)
- ⇒ Most German households think that inflation will be too high and that interest rates will be too low

Data

- Bundesbank Online Pilot Survey on Consumer Expectations
- 3 waves between April and June, 2019
- 6653 observations with about 2000 in wave 1-2, and 2500 in wave 3
- Rotating panel: 500 in each wave, 500 in wave 1&2, 500 in wave 2&3 and 500 in wave 1&3
- Add special questions in wave 1 and 2 (next slide)
- 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

Questionnaire

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?

- ① Higher inflation than expected would be better (*d_infl_highbetter*)
- ② Inflation will be more or less appropriate (*d_infl_reason*)
- ③ Lower inflation than expected would be better (*d_infl_lowbetter*)

Questionnaire

2a: Why do think a higher inflation rate would be better? Which of the following reasons is the most important one from your point of view?

- 1 Because higher inflation would help the economy to invest more and to grow more quickly
- 2 Because private households would be able to pay back their debts more quickly
- 3 Because then the European Central Bank would able to reach its inflation target of inflation under, but close to 2%

2b: Why do think a lower inflation rate would be better? Which of the following reasons is the most important one from your point of view?

- 1 Because with lower inflation the prices of goods and services would grow less strongly
- 2 Because the Bundesbank and the European Central Bank in my opinion do not care enough about the inflation rate
- 3 Because inflation is generally bad for the economy

Questionnaire

3: 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?

- ① Higher interest rate than expected would be better (*d_int_highbetter*)
- ② The interest rate will be more or less appropriate (*d_int_reason*)
- ③ Lower interest rate than expected would be better (*d_int_lowbetter*)

Questionnaire

4a: Why do think a higher interest rate would be better? Which of the following reasons is the most important one from your point of view?

- 1 Because I won't earn enough on my savings
- 2 Because the level of debt in the economy will increase
- 3 Because low interest rates will lead to rising house prices
- 4 Because inflation is too high
- 5 Because the level of economic growth is too high at the moment and this could result in inflation
- 6 Because BuBa/ECB have kept interest rates too low for too long

4b: Why do think a lower interest rate would be better? Which of the following reasons is the most important one from your point of view?

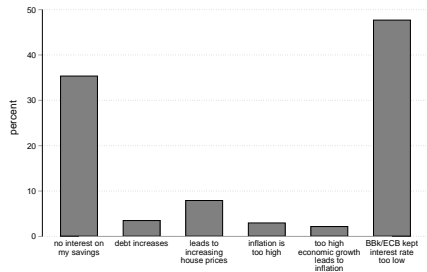
- 1 Because the economy still has not recovered from the financial crisis
- 2 Because credit, for instance for a mortgage, will be too expensive
- 3 Because the German federal government is borrowing too much
- 4 Because economic growth is too low
- 5 Because lower interest rates would help the BuBa and the ECB in reaching their target level of inflation of close, but below 2%

Summary Statistics Opinions

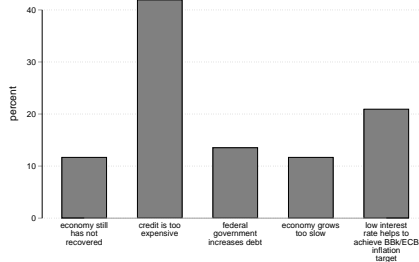
Table: Opinions on Expected inflation and Expected Interest Rate

Expected inflation	Expected interest rate			Total %
	higher better %	reasonable %	lower better %	
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

Summary Statistics Reasons

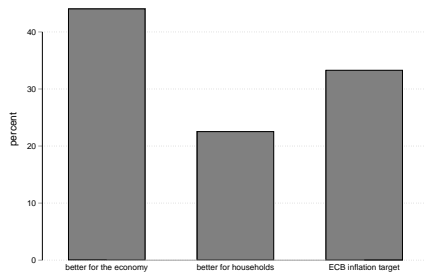


Interest rate too low

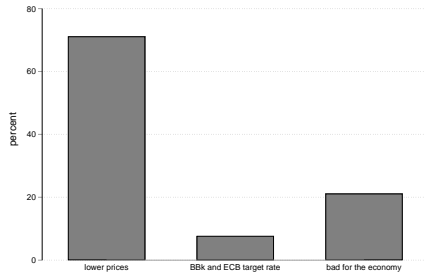


Interest rate too high

Summary Statistics Reasons



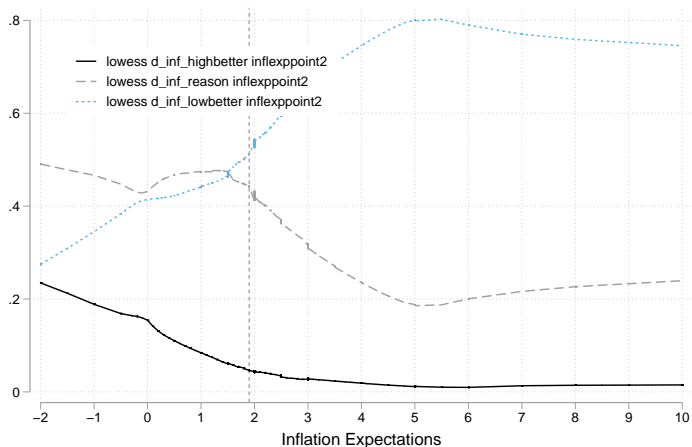
Inflation higher better



Inflation lower better

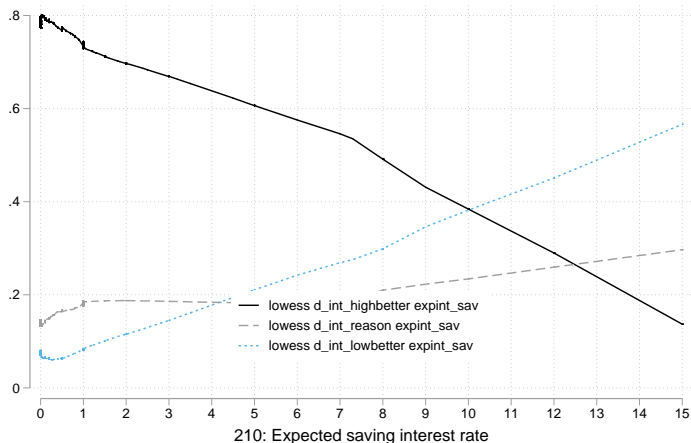
Summary Statistics Opinions

Figure: Opinions and Inflation Expectations



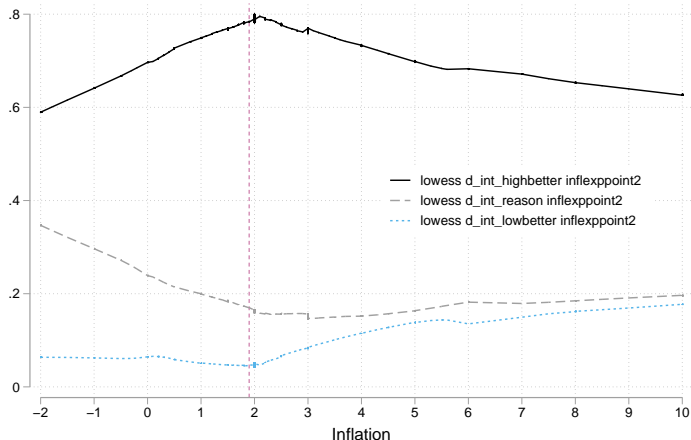
Summary Statistics Opinions

Figure: Opinions and Savings Rate Expectations



Summary Statistics Opinions

Figure: Interest Rate Opinions and Inflation Expectations



Opinions about Future Inflation

Table: Opinions about Future Inflation

	Full Sample			$1.5 \leq \pi^e \leq 2$		
	inf _lowbetter	inf _reason	inf _highbetter	inf _lowbetter	inf _reason	inf _highbetter
d_male	-0.0860***	0.0510*	0.0386***	-0.0867**	0.0445	0.0509***
age	-0.0026*	0.0021	0.0006	-0.0031	0.0018	0.0014
inc_middle	-0.0753	0.1071	-0.0251	-0.2651*	0.2349*	0.2794***
inc_high	-0.1630**	0.1993**	-0.0298	-0.3396**	0.3072**	0.2804***
d_east1989	0.1383***	-0.1470***	0.0062	0.2014***	-0.1931***	-0.0141
d_edu_real	-0.0506	0.0427	0.0095	-0.0778	0.0637	0.0141
d_edu_abi	-0.0751	0.0628	0.0143	-0.1511**	0.1404**	0.0098
d_edu_uni	-0.1992***	0.1576***	0.0382**	-0.2901***	0.2704***	0.0174
d_parttime	0.0490	-0.0397	-0.0098	0.0048	0.0034	-0.0211
d_noemploy	0.1192**	-0.0985*	-0.0246**	0.0492	-0.0479	0.0017
d_retired	-0.0463	0.0478	0.0018	-0.0189	0.0365	-0.0210
N	1517	1517	1517	670	670	670
χ^2	98.335	79.722	32.566	68.440	57.410	944.334
Pseudo R^2	0.054	0.045	0.054	0.088	0.073	0.074

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.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Opinions about Future Interest Rates

Table: Opinions about Future Interest Rates

	Full Sample			$1.5 \leq \pi^e \leq 2$		
	int _lowbetter	int _reason	int _highbetter	int _lowbetter	int _reason	int _highbetter
d_male	-0.0212	0.0281	-0.0081	-0.0190	0.0142	0.0046
age	-0.0031***	0.0005	0.0026**	-0.0041***	0.0005	0.0037**
inc_middle	-0.0769*	-0.0037	0.1138	0.3400***	-0.1860**	0.1454
inc_high	-0.1133***	0.0238	0.1221*	0.3306***	-0.1615*	0.1291
d_east1989	0.0095	-0.0418	0.0322	-0.0122	-0.0729	0.0837
d_edu_real	-0.0076	-0.0280	0.0325	-0.0205	0.0026	0.0094
d_edu_abi	-0.0876***	-0.0928**	0.1689***	-0.0885*	-0.1256**	0.1998***
d_edu_uni	-0.0429*	-0.0541*	0.0902**	-0.0582*	-0.0550	0.1021*
d_parttime	-0.0212	0.0129	0.0059	0.0194	-0.0283	0.0085
d_noemploy	0.0207	-0.0200	-0.0131	0.0204	-0.0880	0.0535
d_retired	-0.0244	-0.0320	0.0603	0.0253	0.0135	-0.0341
N	1617	1617	1617	665	665	665
χ^2	42.220	18.328	35.483	234.724	16.782	21.099
Pseudo R^2	0.077	0.015	0.026	0.152	0.031	0.039

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. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Implications for Current Spending on Durables

Table: Current Spending on Durables (Monthly Expenditure Last Month)

	Full sample				$1.5 \leq \pi^e \leq 2$			
$r_{savings}^e$	-0.0099	-0.0007	-0.0143	-0.0185	-0.0441**	-0.0394**	-0.0485**	-0.0611***
π_{house}^e	0.0248	0.0156	0.0193	0.0210	0.0256	0.0124	0.0089	-0.0046
$d_{inf_lowbetter}$	-0.1761		-0.1695	-0.1604	-0.2361		-0.2710	-0.0337
$d_{inf_highbetter}$	-0.1786		-0.1965	-0.1908	-0.6691		-0.6588	-0.6132
$d_{int_lowbetter}$		0.2668	0.6288**	0.5261		1.0345***	1.0409**	0.1602
$d_{int_highbetter}$		0.2074	-0.1134	-0.0615		0.3447*	-0.2129	-0.1566
$r_{savings}^e * d_{inf_highbetter}$				0.0023				0.1024
$r_{savings}^e * d_{inf_lowbetter}$				0.0019				0.2336
$r_{savings}^e * d_{int_highbetter}$				0.0270				0.0446
$r_{savings}^e * d_{int_lowbetter}$				-0.0430				-1.0740***
cons	5.3160***	4.8137***	5.2379***	5.3234***	4.5282***	3.8511***	4.4208***	4.6603***
Demogr. Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	325.000	668.000	324.000	324.000	139.000	266.000	139.000	139.000
Adj. R ²	0.009	0.044	0.024	0.014	0.084	0.088	0.125	0.128

Note: Bundesbank Online Pilot Survey on Consumer Expectations, second wave. OLS estimations on log truncated spending with population weights. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Implications for Planned Spending on Durables

Table: Planned Spending on Durables (Likelihood to Spend More)

	Full sample			$1.5 \leq \pi^e \leq 2$		
$r_{savings}^e$	0.0051	0.0031	0.0045	-0.0031	0.0006	-0.0027
π_{house}^e	-0.0033*	-0.0019	-0.0028	-0.0056	0.0005	-0.0050
$d_{inf_lowbetter}$	0.0044		0.0093	-0.0510		-0.0447
$d_{inf_highbetter}$	0.0254		0.0244	0.0249		0.0232
$d_{int_lowbetter}$		-0.1049***	-0.1495***		-0.1445**	-0.1449*
$d_{int_highbetter}$		-0.0293	-0.0256		-0.0689**	-0.0249
Demogr. Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	713.000	1460.000	711.000	312.000	594.000	311.000
χ^2	43.870	64.242	52.270	16.836	25.930	19.536
Pseudo R^2	0.037	0.033	0.048	0.033	0.032	0.040

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

Conclusion

- Evaluate the “hidden heterogeneity” in inflation and interest rate expectations:
 - ▶ Around 50% of respondents with inflation expectations $1.5\% \leq \pi^e \leq 2\%$ think future inflation should be lower, share drops only to 30% when consumers expect deflation up to -5%
 - ▶ Close to 80% of respondents with inflation expectations $1.5\% \leq \pi^e \leq 2\%$ think future interest rates should be higher
 - ▶ Respondents mainly prefer lower inflation because prices grow less strongly, and higher interest rates because the BuBa/ECB in their opinion have kept interest rates too low for too long
 - ▶ 20% of respondents preferring lower inflation think inflation is generally bad for the economy.

Conclusion

- Demographic effects on **heterogeneity in opinions** are most pronounced when inflation expectations seem “anchored” ($1.5\% \leq \pi^e \leq 2\%$)
 - Implications for current and planned spending on durables and consumption goods (not shown): HHs who think that lower interest rates would be better have higher current spending on durables, react more to the perceived real rate in current spending, and have lower planned spending on both durables and non-durables
 - Demographic effects also on **heterogeneity in perceptions of monetary policy** (not shown): E.g. older consumers are more likely to think that inflation is generally bad for the economy and that the CB has kept interest rates too low for too long
- ⇒ Important insights for transmission of monetary policy and for efficiency in central bank communication

Thank you for your attention!

Reasons for Thinking Inflation Should Be Lower

Table: Reasons for Thinking Inflation Should Be Lower

	Because Prices Would Grow Less Strongly (<i>d_lowerprices</i>)				Because Inflation is Generally Bad for the Economy (<i>d_infl_badeconomy</i>)			
	$-5 \leq \pi^e \leq 25$	$-5 \leq \pi^e < 1.5$	$1.5 \leq \pi^e \leq 2$	$2 < \pi^e \leq 25$	$-5 \leq \pi^e \leq 25$	$-5 \leq \pi^e < 1.5$	$1.5 \leq \pi^e \leq 2$	$2 < \pi^e \leq 25$
<i>d_male</i>	0.0403	-0.0867	0.0613	0.0713	-0.0554*	-0.0237	-0.0202	-0.0994**
<i>age</i>	-0.0031*	-0.0045	-0.0009	-0.0052**	0.0043***	0.0066*	0.0036	0.0045**
<i>inc_middle</i>	0.1214	1.7773***	0.1499	0.0700	-0.1090	-1.6125***	-0.0910	-0.0786
<i>inc_high</i>	0.1134	1.7632***	0.1299	0.0618	-0.0863	-1.7388***	-0.0149	-0.0415
<i>d_east1989</i>	0.0517	-0.0454	0.0759	0.0365	-0.0477	-0.0698	-0.0427	-0.0336
<i>d_edu_real</i>	-0.0606	0.0218	-0.1155*	-0.0370	0.0340	-0.0632	0.1017**	0.0052
<i>d_edu_abi</i>	0.0350	0.0831	-0.0615	0.1006	-0.0374	0.0132	0.0308	-0.0985
<i>d_edu_uni</i>	0.0175	0.1717	-0.1115	0.0471	-0.0629	-0.0525	0.0683	-0.1591**
<i>d_parttime</i>	0.0420	0.0578	0.0036	0.0834	-0.0448	0.0282	-0.0105	-0.0891
<i>d_noemploy</i>	0.1539**	-0.0316	0.0511	0.2921***	-0.1091*	0.0363	0.0531	-0.2599***
<i>d_retired</i>	-0.1298*	0.1485	-0.0617	-0.2556***	0.0323	-0.2864*	-0.0750	0.1845**
N	858.000	108.000	320.000	430.000	858.000	108.000	320.000	430.000
χ^2	25.137	744.267	8.479	34.245	27.126	500.914	12.522	38.038
Pseudo R^2	0.026	0.077	0.026	0.061	0.034	0.122	0.038	0.076

Note: Bundesbank Online Pilot Survey on Consumer Expectations, first wave. Average marginal effects for the likelihood of choosing this reason reported from estimations with population weights. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Reasons For Thinking Interest Rates Should Be Higher

Table: Reasons For Thinking Interest Rates Should Be Higher

	Because Interest Earnings on Savings Are Too Low ($d_{noint_savings}$)				Because the ECB Has Kept Interest Rates Too Low for Too Long (d_{monpol_wrong})			
	$-5 \leq \pi^e \leq 25$	$-5 \leq \pi^e < 1.5$	$1.5 \leq \pi^e \leq 2$	$2 < \pi^e \leq 25$	$-5 \leq \pi^e \leq 25$	$-5 \leq \pi^e < 1.5$	$1.5 \leq \pi^e \leq 2$	$2 < \pi^e \leq 25$
<i>d_male</i>	-0.0845***	-0.2411***	-0.0617	-0.0574	0.1219***	0.1912**	0.1171**	0.0901*
<i>age</i>	-0.0062***	-0.0111*	-0.0072***	-0.0057**	0.0064***	0.0102*	0.0071***	0.0054**
<i>inc_middle</i>	0.2386**	0.1886	0.3723**	0.1402	-0.2393**	-0.3359*	-0.5149***	-0.0672
<i>inc_high</i>	0.2028**	0.1727	0.3127*	0.1422	-0.2832***	-0.4892***	-0.5391***	-0.1008
<i>d_east1989</i>	-0.0919**	0.0435	-0.0323	-0.1955***	0.0669	0.0102	0.0239	0.1371**
<i>d_edu_real</i>	0.0121	-0.0275	0.0579	-0.0277	-0.0173	0.0076	-0.0545	0.0141
<i>d_edu_abi</i>	-0.0581	-0.3347**	-0.0092	-0.0289	0.0772	0.1601	0.1029	0.0517
<i>d_edu_uni</i>	-0.0854*	-0.3565***	0.0151	-0.1153	0.0596	0.1492	0.0823	0.0257
<i>d_parttime</i>	-0.0424	0.0856	-0.0729	-0.0631	0.0328	-0.1795	0.0402	0.1001
<i>d_noemploy</i>	-0.1072*	-0.0512	-0.0482	-0.1624**	0.0749	0.2949	-0.0012	0.1387
<i>d_retired</i>	0.1613**	0.1741	0.1228	0.2001**	-0.0642	-0.4067	0.0311	-0.1156
N	1254.000	155.000	531.000	568.000	1254.000	155.000	531.000	568.000
χ^2	43.630	18.282	18.473	28.441	58.207	28.972	42.230	21.230
Pseudo R^2	0.034	0.149	0.033	0.051	0.043	0.130	0.062	0.036

Note: Bundesbank Online Pilot Survey on Consumer Expectations, second wave. Average marginal effects for the likelihood of choosing this reason reported from estimations with population weights. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$