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Perceived Inflation in Germany in 2022

Johannes Treu and Johannes Hartwig

ABSTRACT:

The starting point of the paper is the question of the current level of perceived inflation (by consumers) in Germany and the (quantitative) difference between perceived inflation and officially measured inflation. This paper shows that there is a very large difference between the official measured inflation rate and perceived inflation in Germany. While the inflation rate in Germany was 10.0% in September 2022 and 10.4% in October, a nationwide ad-hoc consumer survey revealed that respondents perceived inflation to be 34.15%. At the same time, the paper provides an explanatory approach to explain the perceived inflation using regression models. It becomes clear that all independent variables are highly significant and provide an explanatory contribution. It also shows that higher inflation concerns lead to a higher estimate of perceived inflation.

KEYWORDS:

inflation, perceived inflation, inflation expectations, inflation measurement

JEL classification: E3, E31

INTRODUCTION

In a market economy, prices and especially their development play an inconsiderable role. It is part of the normal play of market forces that prices both rise and fall. If, however, not only the prices of individual products but prices in general increase over time, this is referred to as inflation (Bundesbank, 2022). The increase in prices is measured by the inflation rate. It indicates the percentage by which the price level of goods and services has risen in a given period (Bundesbank, 2022; Mehrhoff, 2017).

A low and stable inflation rate is seen as an indispensable prerequisite for supporting the economic development and steering monetary policy. Thus, households and firms can better plan their consumption expenditures, savings as well as investments in the long run if they can trust that they have accurate knowledge and a correct understanding of the level of the current inflation rate (Schembri, 2020). However, if misperceptions and expectation errors occur, these affect economic agents' decisions regarding spending, saving, as well as borrowing in a way that has negative implications for the economy and the effectiveness of the monetary policy. Thus, individuals' perceptions and expectations have the potential to influence the inflation that occurs as well as other economic outcomes such as wages, output, and the like (Ireland, 2000). Moreover, if both factors deviate from the official inflation rate over an extended period, this may additionally diminish the credibility of the central bank concerning the price stability target (Fritzer & Rumler, 2015). Therefore, the population's perception and expectation of current as well as future inflation are of crucial interest (Fluch, Fritzer & Rumler, 2013). Also, possible inflation perception and expectation errors regarding inflation trends should be reconciled with the actual situation (Fritzer & Rumler, 2015). Nevertheless, in countries such as Canada, the U.S., the U.K., and the Euro area, many people have the perception that inflation is higher than the officially measured inflation rate (Schembi, 2020; Schnabl & Sepp, 2021).

At the beginning of 2021, inflation rates in Europe and in Germany rose sharply after a long phase of low to very low rates. In August 2022, for example, the inflation rate was 7.9%, in September 2022 it was 10.0% and in October 2022 it rose to 10.4% (provisional result confirmed) compared with the same month of the previous year (Statista, 2022). In these times of rapidly rising inflation rates, the current paper takes up the topic of "perceived inflation" and attempts to answer the standing of perceived inflation in Germany. To this end, a Germany-wide ad hoc survey was launched in September 2022, to gain an original consumer dataset. The starting point is the question of the current level of perceived inflation (by consumers) in Germany and the (quantitative) difference between perceived inflation and officially measured inflation. In the same breath, it is of considerable interest to deal with questions about expectations of future price developments, the extent of concerns, and possible consumption restrictions of the population due to the high prevailing inflation. Thus, this paper aims to describe and analyze the available data and investigate possible correlations with perceived inflation.

The structure of the discussion paper is as follows. Following the introduction, a literature review is presented in chapter 2. Chapter 3 describes the data and method. Chapter 4 presents and discusses the results. A summary in Chapter 5 concludes the discussion.

LITERATURE REVIEW

Perceived inflation can be understood as the public's subjective perception of price changes (Hecheltjen & Bongartz, 2008). Particularly during the introduction of the Euro in the early 2000s, a discrepancy between perceived and measured inflation was repeatedly mentioned (so-called "teuro debate"). Fluch & Stix (2005), for instance, investigated Austrians' inflation perceptions during this period and found that perceived inflation deviated significantly from actual inflation. Giovane & Sabbatini (2006) also show a similar result for Italy. In a representative survey in

Austria in 2013, Fluch, Fritzer & Rumler (2013) find that respondents have higher perceived inflation than indicated by actual inflation. Based on survey data, Fritzer & Rumler (2015) suggest how respondents' perceived inflation depends on age, education, income, household size, and place of residence. Detmeister, Lebow & Peneva (2016) find in their survey for the U.S. that the perceived inflation of surveyed participants is higher than the actual value. In this context, women have higher perceived inflation than men and the level of perception decreases with increasing age and income. Similarly, Merhoff (2017) shows that the formation of perceived and expected inflation strongly depends on socio-demographic factors, such as age, household size, gender, and employment status. Arioli et al. (2017) show that for the Eurozone and the EU over the period 2004-2015, consumers' quantitative inflation estimates were higher than actual inflation according to the Harmonized Index of Consumer Prices (HICP). Meyler & Reiche (2021) pick up on these results and also present higher perceived inflation than officially measured inflation for a longer period (2004-2021). In the wake of the COVID-19 pandemic, Weber, Gorodnichenko & Coibion (2022) also show existing inconsistencies between expected, perceived, and actual inflation for U.S. households.

These divergences can have different origins. One explanation is differences in the degree of attention of market participants. As Sims (2009) points out that attention to price developments is low in times of low inflation (rational inattention), and only when inflation rises considerably does price development become a stronger focus of attention. This makes signal processing errors more likely, leading to a higher probability of heterogeneous expectancies. Although inflation expectations are not the sole determinant of how inflation arises, it nevertheless requires the consideration of other dimensions. These may be, for example, the output gap, foreign price developments, or the importance of price-setting in the labor market (Bårdsen et al., 2005).

In an overview, Hommes (2018) discusses the implications of different expectations for monetary policy. In this context, the credibility of the central bank (so-called "forward guidance") plays a central role, as it has a stabilizing effect. In regimes in which this stability-inducing credibility is questioned by an increasing number of market participants, self-reinforcing processes can occur and self-fulfilling high inflation persistence can result. As Hommes (2018) points out, coordination problems are amplified in macroeconomic systems with strong positive feedback. Thus, the form of feedback is crucial, as laboratory experiments show that aggregation of expectations can only compensate for individual errors of market participants in the presence of negative feedback, while, in the presence of positive feedback, small individual deviations from rational expectations reinforce each other (Assenza et al., 2014). For this reason, the central bank needs to take note of market agents' expectations and respond to changes accordingly. However, measuring inflation expectations is not so straightforward: laboratory experiments often recruit university students (e.g., Pfajfa and Žakelj, 2018; Massaro, 2013; Assenza et al., 2013), which helps identify the heuristics in use but does not allow for good inferences about the general population, especially for the critical link between inflation expectations and subsequent wage bargaining (or price setting for the self-employed).

Central banks are aware of these issues and try to systematically interrogate inflation expectations (Armantier et al., 2013). A major challenge in accounting for household inflation expectations is that they are not always formed based on rational considerations (Pfajfa and Žakelj, 2018). In particular, in the presence of structural breaks, as currently seems to be the case (Borio, 2022), welfare losses can be expected if the central bank does not sufficiently account for the deviation from rational expectations (Molnár and Santoro, 2014). In times of high and volatile inflation, for example, expectations are more strongly influenced by media reports, and a divergence arises between perceived or perceived and expected inflation (Draeger, 2015).

The following problems also arise from surveys of inflation expectations (Armantier et al., 2013). First, it is unclear whether the survey reflects the true opinions of the participants. Second, the actors may not act according to their opinions. In particular, heterogeneous expectations seem to be much more prevalent in the measurement of household inflation expectations than is the case, for example, with professional forecasters (Cavallo et al., 2017). This may stem from the fact that consumers' expectancies are more influenced by everyday experiences such as supermarket prices, rather than considering the entire consumption bundle (Cavallo, Cruces & Perez-Truglia, 2017). For example, Roth & Wohlfart (2020) found in their survey that consumers integrate macroeconomic factors into their expectations more pessimistically than professional forecasters. One reason is (paradoxically) the European Central Bank's successful monetary policy in the past, which has led to less attention regarding inflation rates than is the case in high-inflation countries (Coibion et al., 2020). However, the success of monetary policy primarily refers to low inflation rates and not to the communication of the same or the correct assessment of past inflation rates by consumers (Coibion et al., 2020). The latter in particular is strongly influenced by insufficient information (Binder and Rodrigue, 2018). The results also show a large influence of questionnaire design. For example, the use of multiple-choice response options leads to less variability in the answers given than with freer response options (Coibion et al., 2020).

METHODOLOGY AND DATA

A quantitative approach is used in empirical research to collect large amounts of data. Furthermore, this method is used to quantify opinions, behaviors, and other predefined variables. The approach requires a more structured format and a predefined sequence of closed questions, which are relatively easy to answer and result in a high response rate.

In the empirical study conducted here, the underlying unique dataset was obtained with the help of an anonymous nationwide online consumer survey in the period from September 8th, 2022 to September 12th, 2022. Due to the nature of an ad hoc survey and to achieve a representative sample size, recourse was made to a market research panel of the provider "GapFish". This has the largest ISO-certified online access panel in the German-speaking world. The total sample size is 1,200 people between the ages of 16 and 65, representative of age and gender.

The content of the questions related to the individual perception of inflation, which was asked on a scale of 0-100. In addition, respondents were asked to state how they expected prices for goods and services to develop over the next month, to what extent they were concerned about inflation and in which (predefined) areas of consumption they would cut back and to what extent. In addition, sociodemographic characteristics such as gender, age, educational attainment, household net income, and occupational situation were queried.

Since this paper takes a quantitative approach to research, the data collected is analyzed using statistical methods, here multiple linear regression, and binary logit model to explain the perceived inflation. In this way, the research findings can be analyzed and interpreted regarding the theoretical starting argumentation from chapter 2. The corresponding evaluations were performed with the help of the software program "Gretl". For this purpose, different regression models and correlations are calculated for different dependent variables. At the same time, an attempt is made to explain whether perceived inflation influences restrictions in the daily life of the respondents. Likewise, a descriptive evaluation of the data set is carried out.

RESULTS

The descriptive results of the socio-demographic characteristics can be described as follows. A total of 1200 people participated in the survey, with an equal gender distribution (m=49.9% and

w=50.01%).¹ The distribution of age structure is weighted according to the German population so that the group 51-65 years has a higher proportion (35.5%). With a value of 7.3%, the age group up to 20 years is the least represented, while with 10.5% the group 31-35 years has the second highest expression. In terms of educational attainment, the majority of respondents (33.9%) have a Mittlere Reife (Certificate of Secondary Education), followed by 23.7% with a university degree. Well, over half (62.8%) are employed in a salaried position. All other results on the occupational situation are well below 10%, with the group of retirees representing the highest proportion at 9.3%. Also queried was the monthly net household income in a range from "up to €1,000" to "more than €5,000." At 13.0%, most study participants have a monthly net household income of €2,001 to €2,500.

Concerning the measurement of perceived inflation (expressed as a percentage), the arithmetic mean for the entire sample is 34.15% and the median is 25.0%. It should be noted, however, that 49 subjects reported the maximum value of 100% as their perceived inflation. This could be a possible source of error (predefinition of the answer option combined with the assumption that the respondents simply chose 100 because this is the highest value). If the result is differentiated according to both genders, it can be seen that women have a higher average perceived inflation (39.3%) than men (29.0%). This reveals a very large discrepancy between the official inflation rate, which is measured using a basket of 650 types of goods and represents all goods and services purchased by private households in Germany. Figures 1 and 2 illustrate the results.

¹ Although gender requires more than a binary classification into female and male, the data currently available for such an analysis are limited. In general, the numbers are too small to allow a breakdown by additional variables. Therefore, in this study, gender is considered only in a binary system.

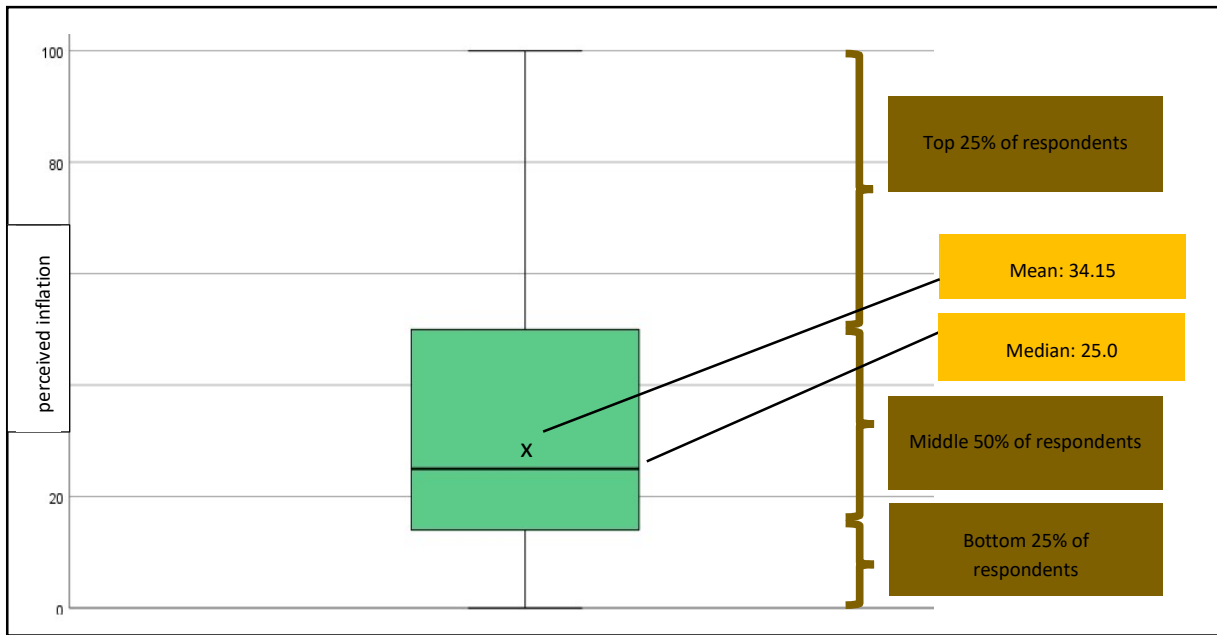


Figure 1: Boxplot of perceived inflation for the entire sample (data in percent)

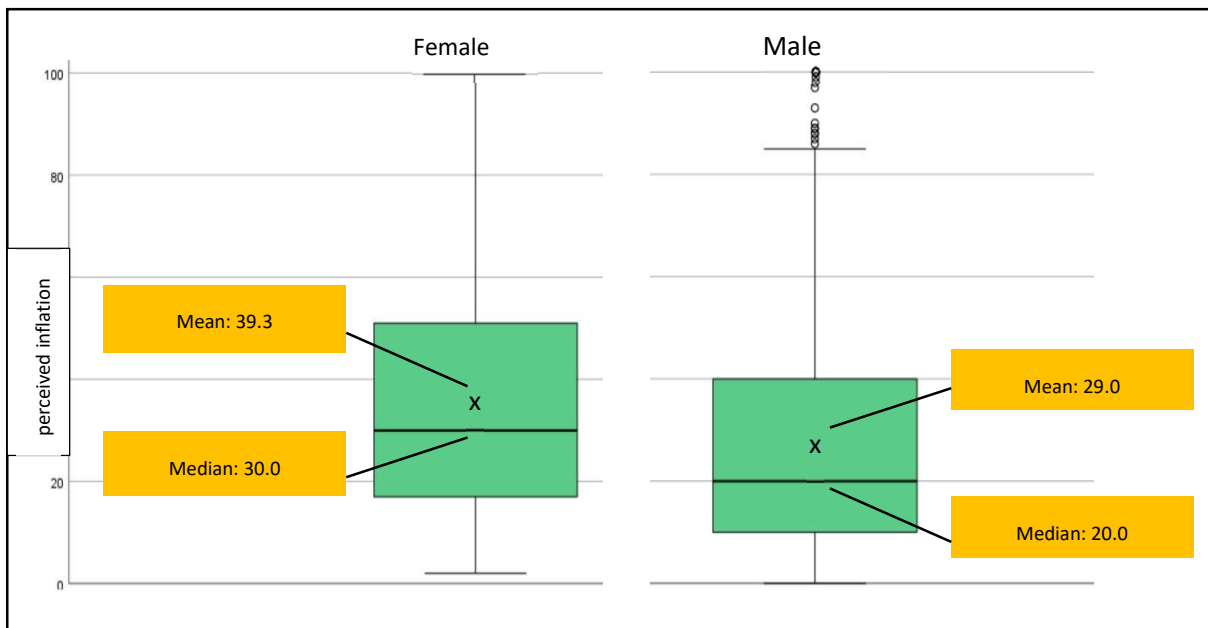


Figure 2: Boxplot of perceived inflation by gender (data in percent)

When asked how prices for goods and services will develop in the coming months, the majority of respondents (62.0%) indicated that they expect prices to be higher than in the previous month.

Looking at the two genders, the descriptive analysis shows no difference in terms of price increase expectations. Thus, 62.6% of women and 61.3% of men say that prices will be higher than in the previous month (see figures 3 and 4).

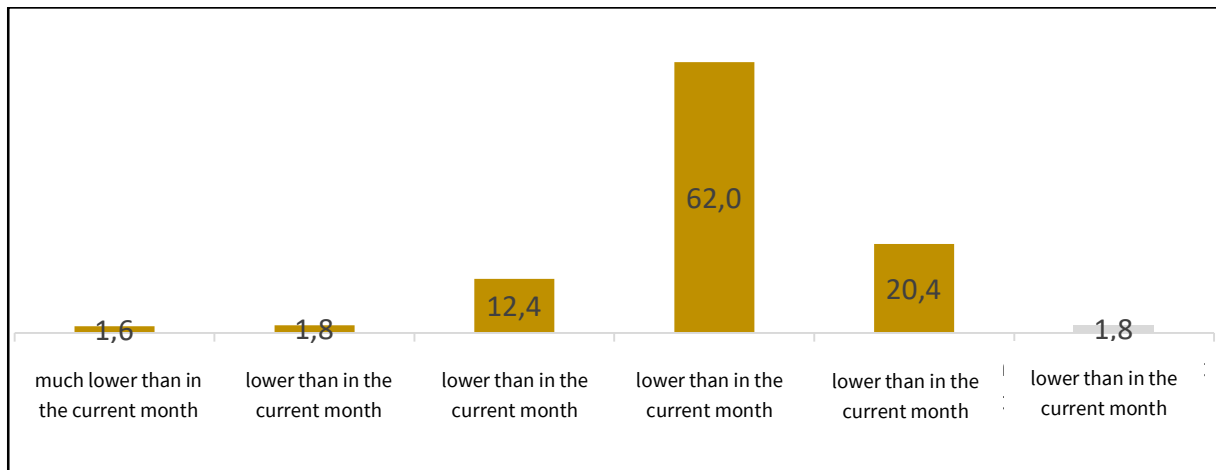


Figure 3: Expected price development, total sample (figures in percent)

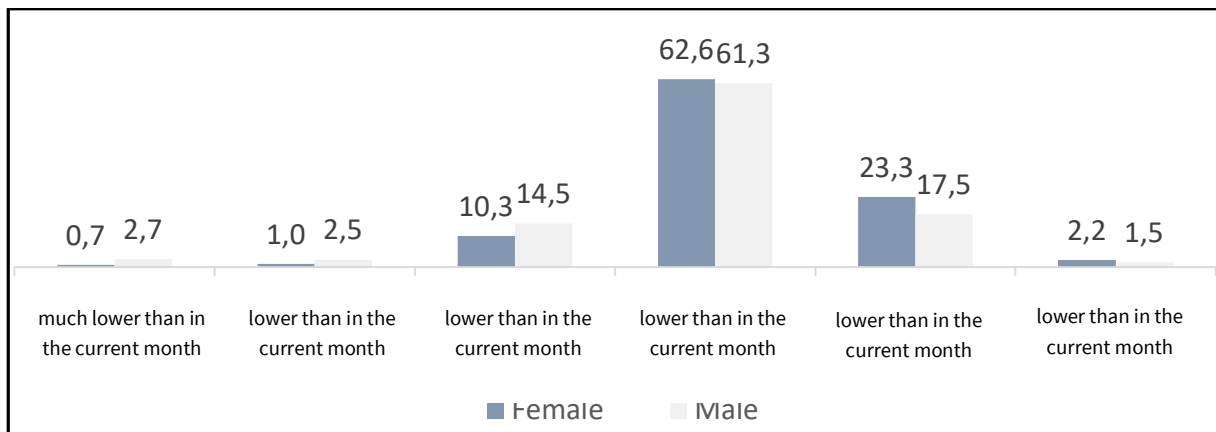


Figure 4: Expected price development by gender (figures in percent)

Regarding the question of whether the current inflation is a cause of concern for the respondents, it can be stated for the sample that 54.6% of all participants, irrespective of gender, are very concerned. Again, a gender-specific difference is striking here. For example, 60.8% of the women

surveyed said they were very worried about current inflation. By contrast, the proportion of very worried men is lower at 48.4%. Figures 5 and 6 illustrate the results.

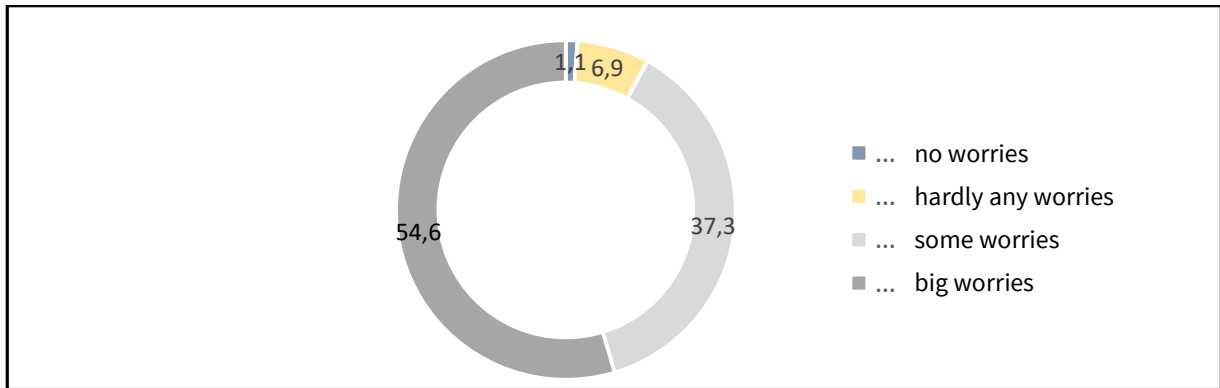


Figure 5: Inflation concerns, total sample (figures in percent)

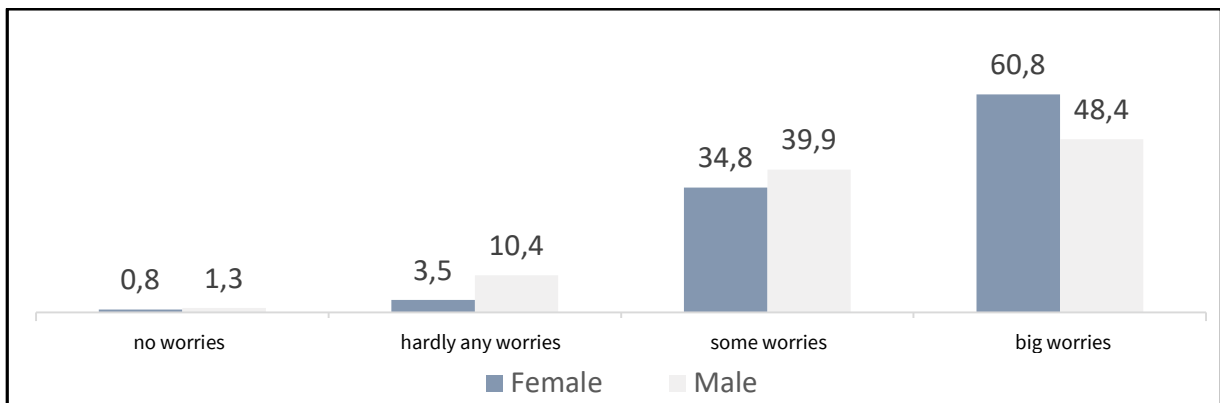


Figure 6: Inflation concerns by gender (figures in percent)

Looking at the areas where respondents cut back the most due to high inflation, these are (i) household goods (e.g., furniture, appliances, decorations), (ii) water, electricity, gas, and other fuels, and (iii) travel and hotels. The three areas where respondents cut back the least are (i) alcoholic beverages and tobacco products, (ii) media as well as entertainment, and (iii) education. Again, there is a noticeable gender difference; across all areas surveyed, women tend to restrict themselves more than men (see Figures 7 and 8).

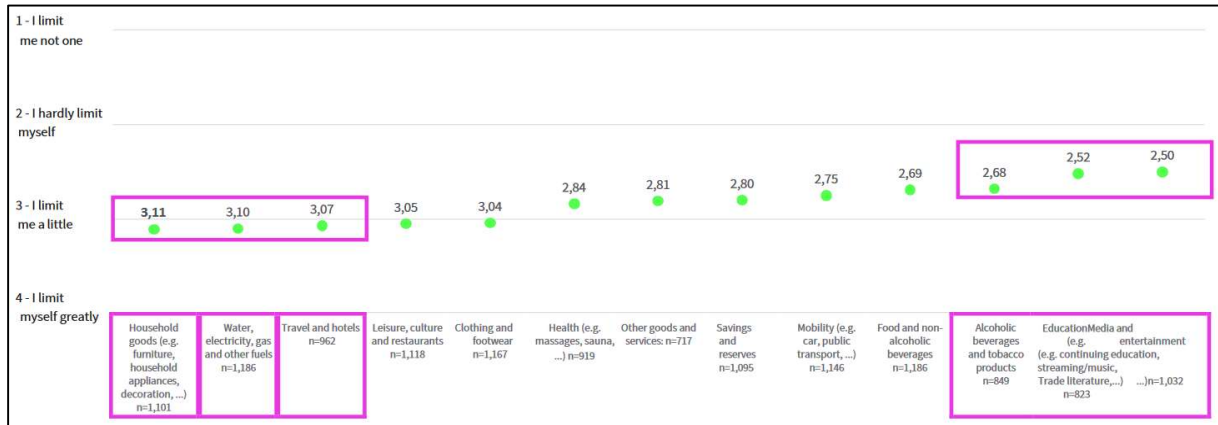


Figure 7: Limitation due to inflation (mean value, only respondents who use/consume the respective area)

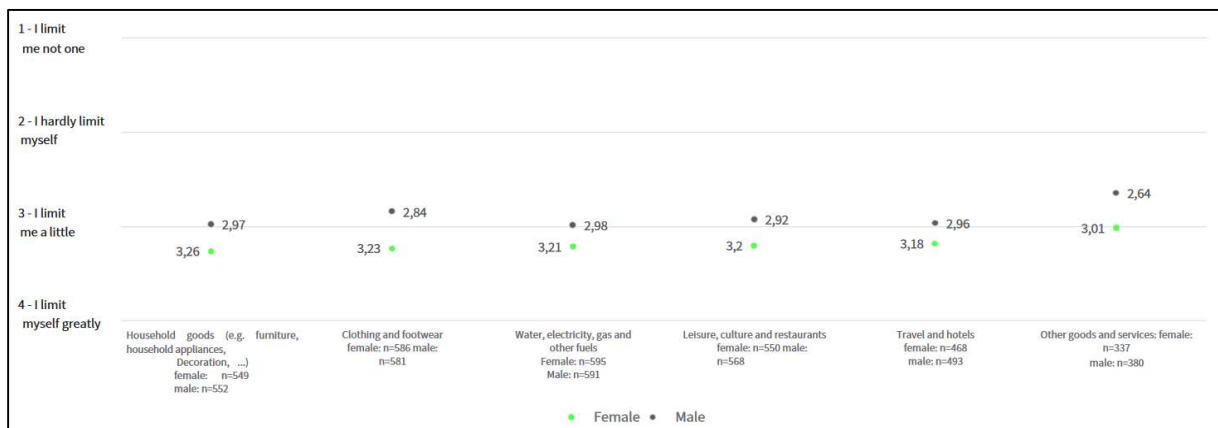


Figure 8: Limitation due to inflation by gender (mean value, only respondents who use/consume the respective area).

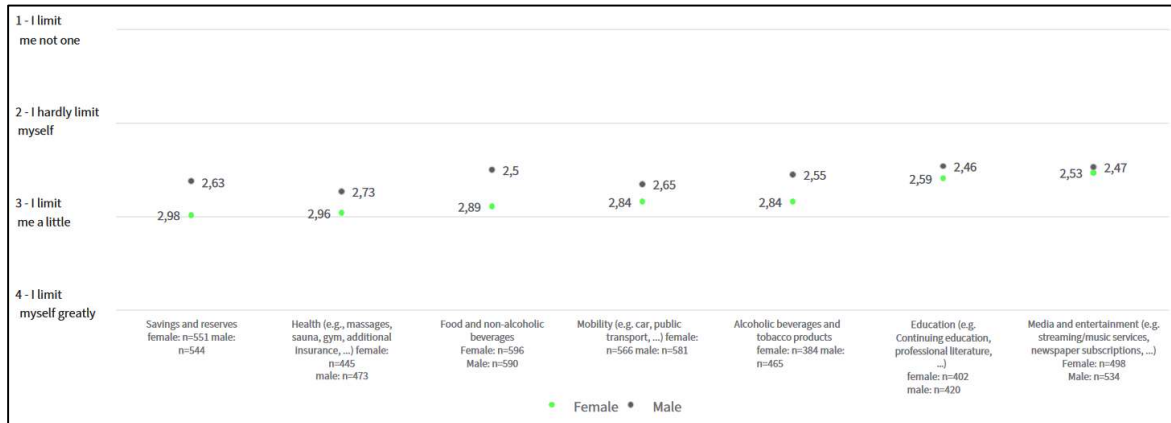


Figure 8a: Limitation due to inflation by gender (mean value, only respondents who use/consume the respective area).

In addition to the descriptive evaluation of the data, a second evaluation step attempts to explain the occurrence of perceived inflation. To this end, various regression models are used to examine the nature of the relationships between an endogenous variable and several exogenous variables. The starting point for the analysis is figure 9, which shows the frequency distribution of perceived current inflation. The wide range of responses with a concentration around the "true" inflation value (in September 2022 - 10%) is striking. Nevertheless, a considerable share of respondents assesses perceived inflation to be significantly higher than officially measured inflation.

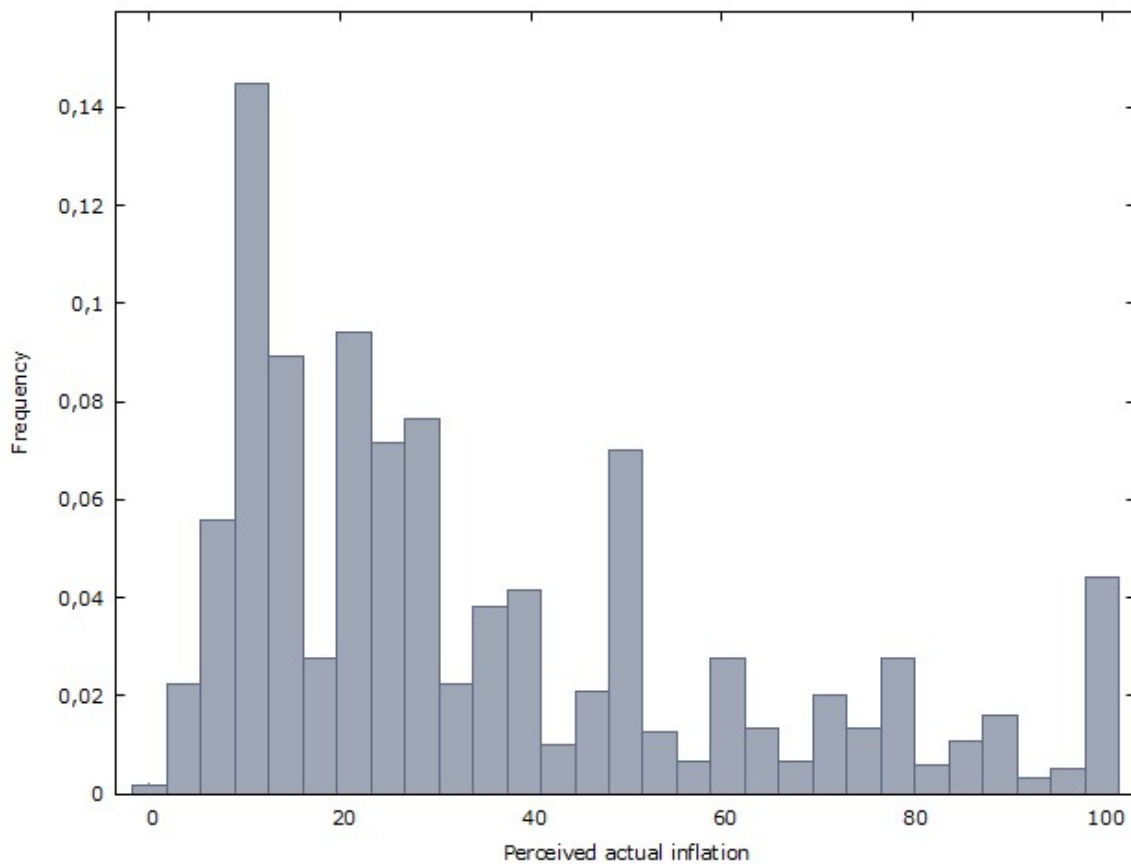


Figure 9: Diagram of frequency distribution current perceived inflation

How can the occurrence of perceived inflation be described? The following variables and hypotheses suggest themselves here:

- i. Age: it is assumed that people who have already had experience with higher inflation rates in the past are better able to assess the current situation or to classify it better historically based on their life experience and do not "overestimate" current inflation as much as younger age cohorts. Expected sign of the respective coefficient negative.
- ii. Inflation concerns: Individuals who are concerned about current inflation may tend to have higher inflation perceptions. Expected sign of the respective coefficient positive.

- iii. Educational attainment: higher educational attainment could help to better understand the phenomenon of inflation and not to overestimate the current numerical values. Expected sign of the respective coefficient negative.
- iv. Household net income: with a lower net income, the savings rate is generally lower than with a higher net income. As the individual basket of goods differs here, this may also have an impact on perceived inflation. Expected sign of the respective coefficient negative.
- v. Gender: various studies show that women perceive inflation to be higher than men. This could be explained by differences in consumer behavior. Expected sign of the respective coefficient negative

When these variables are included in a linear regression model, Figure 9 yields the following estimation model to explain perceived inflation (Table 1):

	Coefficient	Standard error	p-value
Constant	42.2174	3.98406	0.0000
Age	-1.07333	0.345659	0.0020
Inflation worries	5.60020	1.13688	0.0000
Education degree	-2.68381	0.497071	0.0000
Net household income	-0.887257	0.207693	0.0000
Dummy gender	-7.08266	1.44478	0.0000
Sample size			1,046
Sum of squared residuals			3353.96
R²			0.133664

Table 1: Linear regression model for the estimation of perceived current inflation.

Table 1 shows the coefficient values with the associated p-values and standard errors. All variables are significant and thus they explain the perceived inflation. The underlying model was estimated heteroskedasticity-corrected using gender as a dummy variable. This results in an R² of 0.134. Figure 10 illustrates the residuals of the estimation model and Figure 11 is the test statistic for the normal distribution of the residuals.

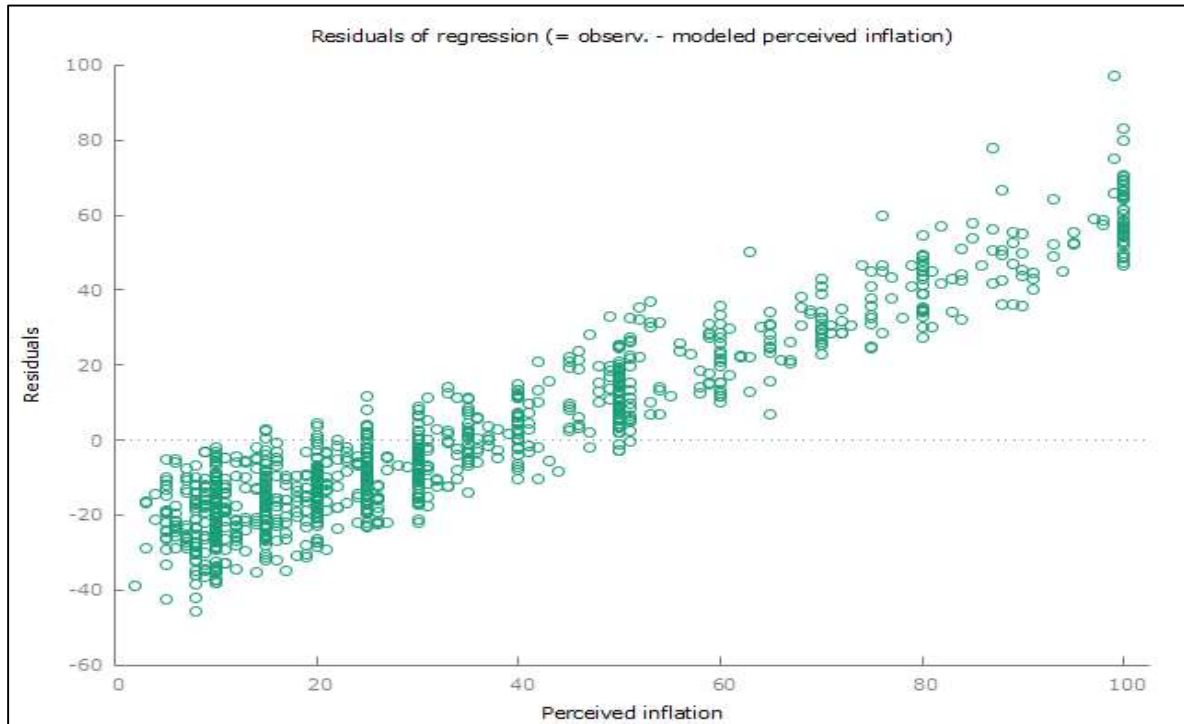


Figure 10: Residuals graph for estimating perceived current inflation.

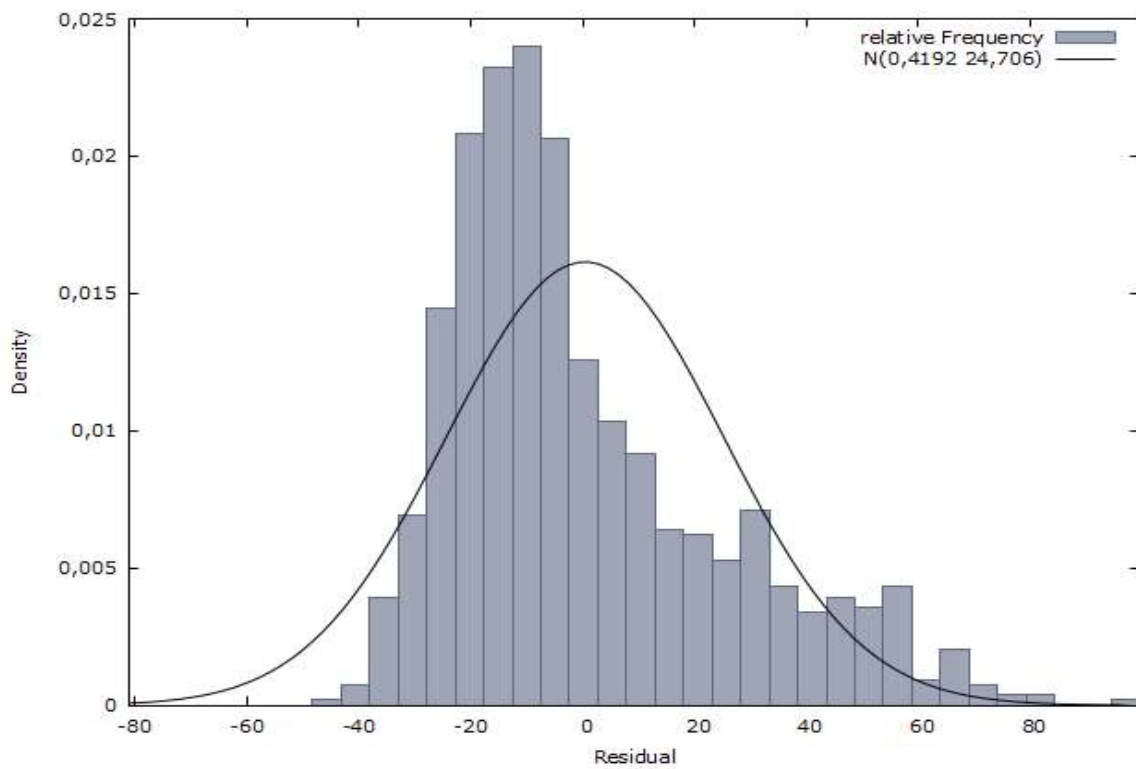


Figure 11: Test statistic for normality distribution of residuals

The following comments can be made in this regard:

- i. All coefficients are highly significant. Thus, the selected variables have a significant impact on the result and can be used to explain the level of perceived current inflation. Other variables, such as inflation expectation, were not included because they do not have a secured statistical influence on the result.
- ii. However, a large share of perceived current inflation cannot be explained by the available data. This is evident from an R^2 value of 0.134, which gives the model only a low explanatory value. Second, the high numerical value for the constant of 42.2 and the comparatively small coefficients for the other variables. Furthermore, it can be seen from figure 10 of the residuals and the test of the normal distribution in figure 11 that a large part of the deviations and the left skew of the residual distribution result from the fact that a high proportion of respondents also stated the actual current inflation value as being felt (see also the frequency distribution in figure 9). In sum, this leads to an excessively large influence of the constant on the result. The large heterogeneity of the responses on perceived inflation also does not seem to be explained by systematically identifiable response tendencies of certain population groups in the sample.
- iii. With a value of 5.60, it is clear that higher inflation concerns also lead to a higher estimate of perceived inflation. This means that major inflation concerns contribute roughly 16.8% to the current inflation estimate. The influence of gender is even stronger, i.e., on average men perceive inflation to be about 7 percentage points lower than women. Higher educational attainment also leads to a significant decrease in the baseline value of 42, so individuals with a doctorate (which was included as the highest educational attainment), lead to an average inflation perception of about 24%

(depending on the other explanatory variables in the model). Age and household net income do not have a pronounced effect on the result but support the assumptions made to include these variables in the model.

- iv. The collinearity analysis (Belsley-Kuh-Welsch test) reveals a moderate linear dependence (condition index of 15.078) between the constant (variance ratio 0.975) and inflation concerns (variance ratio 0.735). This indicates that despite a low-moderate linear relationship between perceived inflation and inflation concerns (Spearman's Rho = 0.2477), a greater influence of inflation concerns on perceived inflation becomes apparent in the interaction with the other variables. In the present estimation model, these two coefficients can only be determined moderately well. However, omitting inflation concerns leads to a model with even lower explanatory power (R^2 of 0.0915) with a higher value for the constant (56.5495). From this, one can take the hint that the relationship between inflation concerns, and perceived inflation needs to be further explored. At the same time, the possible response categories for inflation concerns should be expanded.

From the analysis of the above model, the importance of inflation concerns for the perception of inflation can thus be derived. The structural "break" in expectations, which is reflected by a significantly higher inflation rate in recent months compared with previous years, suggests here that there is a perception bias in the assessment of the numerical values for the inflation rate. The inflation concern variable also plays a weighty role in the assessment of inflation developments, as can be seen below.

Table 2 shows the frequency distribution for expectations regarding the development of the inflation in the next month. Less than 20% of the respondents expect the inflation rate to remain

the same or to fall. This is astonishing because of the in part high values for current perceived inflation (see Fig. 9).

	Frequency	Rel. frequency	Cumulated
Much lower than the current month	21	1.75%	1.75%
Lower than the current month	30	2.50%	4.25%
Consistent with the current month	164	13.67%	17.92%
Higher than the current month	737	61.42%	79.33%
Much higher than the current month	226	18.835	98.17%
I do not know	22	1.83%	100%

Table 2: Frequency distribution of inflation expectations for the next month

What can be used to explain this inflation expectation? For this purpose, we use the same variables as in the above model, including perceived inflation. However, it turns out that some of the variables are not significant. For example, in the full estimation model, perceived inflation has a p-value of 0.78 and thus cannot be used well to explain inflation expectations. Spearman's rank correlation coefficient (Rho) also shows only a weak relationship between the two variables here, at 0.1095. The correlation between net household income and inflation expectations has a Rho of

-0.0147, while educational attainment and inflation expectations have a Rho of -0.0153 and occupational situation and inflation expectations have a Rho of -0.0435.

Therefore, only three variables appear in the alternative estimation model for inflation expectations: Age, inflation concerns, and gender. Table 3 shows the results of the model specified in this way for estimating inflation expectations for the next month.

	Coefficient	Standard error	p-value
Constant	2.79522	0.0929050	0.0000
Age	0.0345419	0.00847701	0.0000
Inflation worries	0.446181	0.0333850	0.0000
Dummy gender	-0.108070	0.0398428	0.0068
Sample size			1,178
Sum of squared residuals			4361.480
R²			0.163643

Table 3: Linear regression model for the estimation of inflation expectations in the next month.

The model in table 3 shows that all variables are significant and that inflation is at least expected to remain more or less constant over the next month (constant coefficient of 2.795). The inflation concerns, which are in the order 1 (no concerns), 2 (hardly any concerns), 3 (some concerns), and 4 (great concerns), have a clear influence on how the inflation trend is expected to develop. For example, a person who is very worried about current inflation will also expect higher inflation next month. There is a clear correlation between inflation expectations and inflation concerns, which is

also expressed by the moderately high value of 0.42832 for Spearman's rank correlation coefficient. In the analysis of collinearity (Belsley-Kuh-Welsch test), a moderate linear dependence (condition index of 11.487) between the constant (variance coefficient of 0.962) and inflation concerns (variance coefficient of 0.944) is found for this model, similar to the model in Table 1. Thus, again, inflation concerns are a large driver of the results. When inflation expectations are explained by inflation concerns alone, a similarly large value for R^2 (0.1413) emerges as in the more comprehensive model in table 3 (0.1636).

However, a linear model has weaknesses in assigning categories to ordinally scaled dependent variables, as is the case in the model in table 3. For this reason, logit models are often used for such metrics. A simple logit, applied to the inflation expectation variable, would be whether the individual estimates that inflation will be higher or much higher in the next month (coded 1) or the same or lower (coded 0). Table 4 reports the results of this estimation model.

	Coefficient	Standard error	Gradient
Constant	-1.14714	0.286624	
Age	0.100667	0.0341033	0.0142475
Inflation worries	1.03818	0.108044	0.146934
Dummy gender	-0.288548	0.156720	-0.0408662
Number of 'correctly predicted' cases			966 (80.5%)
Means dependent variables			0.802500
Mc-Fadden-R²			0.107004
Forecast versus actual results		Forecasted	
		0	1
In fact	0	32	205
	1	29	934

Table 4: Binary logit model for estimating the prediction of rising inflation expectations in the next month.

Here, the logit model shows that inflation concerns significantly increase the probability of estimating rising inflation rates in the next month. However, the larger share of rising inflation expectations significantly increases the susceptibility to errors for false negatives. For example, as shown in table 4, unchanged or falling inflation expectations are predicted 61 times by the model,

but only 32 cases are predicted correctly. This compares with 934 correctly predicted higher inflation expectations with 205 incorrect predictions. In contrast, if one uses an ordered ordinal logit, which can account for the different response categories in expected inflation, the difficulty exists that inflation concerns have fewer response categories than inflation expectations. However, extending this model with the variables from the linear model in Table 1 results in the problem that the coefficients for these variables are all nonsignificant. Consequently, with 63.1% of the cases 'correctly predicted', which would show higher quality with more response categories than in the model in Table 4, the model quality would no longer be given (see details in Table 5).

	Coefficient	Standard error	p-value
Alter	0.0864937	0.0294913	0.0034
Inflation worries	1.32930	0.105248	0.0000
Education degree	-0.0129616	0.0455739	0.7761
Net household income	0.0258400	0.0188566	0.1706
Dummy gender	-0.187230	0.129202	0.1473
Cut 1	-1.17736	0.400390	0.0033
Cut 2	-0.125384	0.347386	0.7181
Cut 3	1.72201	0.333072	0.0000
Cut 4	5.22079	0.377972	0.0000
Number of 'correctly predicted' cases			654 (63.1%)

Means dependent variables	3.968147
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Table 5: Ordinal logit model for estimating the forecast of rising inflation expectations in the next month

Thus, one can conclude that inflation concerns have a decisive impact on inflation expectations, even though limitations in the query methodology prevent us from examining the exact relationship in more detail. This point can be taken up for future research.

The two most important variables, perceived inflation, and inflation concerns can also be used to model and explain consumption restraint in various areas. Table 5 shows the coefficient values for the constant, inflation concerns as well as perceived inflation and the associated significance values along with the explanatory power of the model. Figure 12 compares these values in a scatter plot.

	Coefficient			p-value			R ²
	Constant	Inflation worries	Perceived inflation	Constant	Inflation worries	Perceived inflation	
1	0.760016	0.511328	0.00160730	0.0000	0.0000	0.0721	0.17213
2	0.354134	0.544705	0.00178707	0.0007	0.0000	0.1033	0.14188
3	0.477280	0.624874	0.00079197	0.0000	0.0000	0.4276	0.20027
4	0.344215	0.480473	0.00523713	0.0003	0.0000	0.0000	0.15840
5	0.331578	0.650150	0.00383596	0.0008	0.0000	0.0002	0.22794
6	0.363161	0.602359	0.00495493	0.0002	0.0000	0.0000	0.20776
7	0.420352	0.603037	0.00484303	0.0002	0.0000	0.0000	0.19130
8	0.152663	0.603469	0.00599084	0.2098	0.0000	0.0000	0.18147
9	0.276763	0.515372	0.00431578	0.0306	0.0000	0.0019	0.13062
10	0.269951	0.433242	0.00251459	0.0242	0.0000	0.0449	0.08307
11	-0.043310	0.535530	0.00608975	0.7407	0.0000	0.0000	0.14262
12	0.0697747	0.617724	0.00640709	0.5082	0.0000	0.0000	0.20823
13	0.212480	0.598755	0.00393315	0.0895	0.0000	0.0040	0.19270

1 Water, electricity, gas, and other fuels, 2 Mobility (e.g., car, public transport, ...), 3 Leisure, culture, and restaurants, 4 Food and non-alcoholic beverages, 5 Household goods (e.g., furniture, household appliances, decoration, ...), 6 Clothing and shoes, 7 Travel and hotels, 8 Health (e.g. massages, sauna, gym, supplementary insurance, ...), 9 Alcoholic beverages and tobacco products, 10 Media and entertainment (e.g., streaming/music services, newspaper subscriptions, ...), 11 Education (e.g., continuing education, professional literature, ...), 12 Savings and reserves, 13 Other goods and services.

Table 5: Linear regression model for the estimation of consumption restrictions in the different areas.

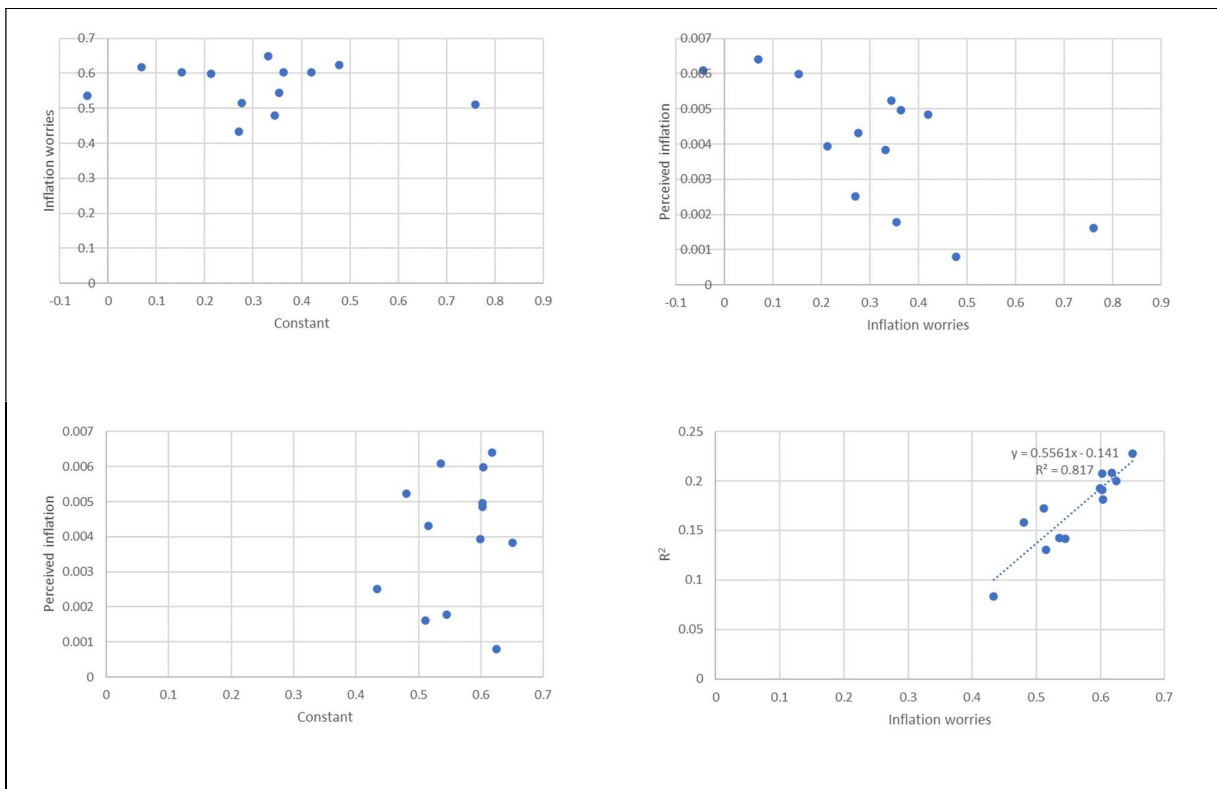


Figure 12: Scatter plots of the coefficient values for the consumption restrictions in the different areas.

From the fourth chart in Figure 12, we can see the tendency that the higher the explanatory power of the model, measured in R^2 , the higher the influence of inflation concerns. This tendency does not exist for the values of the constant as well as perceived inflation. This means that in the area in which the estimation model is more accurate, consumption restraints can rather be explained by inflation concerns. It should be noted, however, that not all coefficients are significant in every model. This is only true for inflation concerns without restrictions.

SUMMARY

This paper shows that there is a very large difference between the official measured inflation rate with its basket of 650 types of goods and the perceived inflation in Germany. While the inflation rate in September 2022 was 10.0 % and in October 10.4 %, a nationwide survey revealed that respondents have a perceived inflation of 34.15 %. For women, the average is even slightly higher at 39.3 %, while in comparison men have a perceived inflation of 29.0 % on average. Overall, 91.9% of respondents are somewhat or even very concerned about the current inflation situation. There is also a gender difference. For women, the major concerns are 60.8%, while for men the figure is 48.4%. Overall, 82.4% of respondents expect prices to continue rising. For women, the expectation (much higher/higher than in the current month) is as high as 85.9%. For men, on the other hand, it is 78.8%. The survey also shows that the least savings are made in alcohol, education, and media. By contrast, the highest savings are made in household goods, energy and travel. It is also interesting to note that across all the areas surveyed, women tend to cut back more than men.

If we try to explain perceived inflation with the help of a linear regression model, we find that all independent variables are highly significant and make an explanatory contribution. Furthermore, it becomes clear that higher inflation concerns lead to a higher assessment of perceived inflation. Nevertheless, part of the perceived current inflation cannot be explained by the available data. This

is shown by an R^2 value of 0.134. The reason for this limitation is the short-term nature of the ad hoc survey and the scope of the items asked. Further research is needed, on the one hand with a more comprehensive questionnaire that includes additional explanatory components on inflation perceptions. On the other hand, a repetition of the survey after possible economic policy measures is conceivable to investigate whether economic policy can reduce perceived inflation and the concerns of German citizens.

If we also look at inflation expectations in a linear regression model and a logit model, we see once again that inflation concerns significantly increase the probability of estimating rising inflation rates in the next month. It should be noted, however, that the explanatory power in the linear model is in the lower range, with an R^2 value of 0.1636. In the logit model, on the other hand, the model goodness of fit is 80, 5%. As a reason for the limitation in these models, the same arguments as in the previous section can be put forward. The same applies to the need for research, which is again pointed out here. In addition, the two most important variables, perceived inflation, and inflation concerns provide a possible contribution to modeling or clarifying consumption restrictions in various areas.

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