Perceived Deflation Risk

Julian Beatty* Steffen Hitzemann†

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Abstract

During the recent high-inflation period, consumer expectations of future inflation rates have surprisingly become *negatively* skewed, exhibiting a pronounced deflation tail. We show that this pattern is not observed for professional inflation forecasts or option-implied inflation probabilities. Exploring this unique setting to investigate the causes and effects of expected deflation, we find that the increase in perceived deflation risk is prevalent among various demographic groups and not associated with an expected worsening of general economic conditions (i.e., recession). Individuals with high perceived deflation risk expect higher job security, and they do not anticipate significantly lower individual earnings or household income compared to the general population. At the same time, these individuals expect lower stock prices, declining home prices, and lower individual household spending. Our results are consistent with consumers viewing deflation as a reversal of profit-led inflation, and suggest that they may not fully incorporate the potential negative long-term equilibrium effects of deflation into their expectations.

Keywords: inflation, deflation, consumer expectations, behavioral biases, inflation options.
JEL codes: D12, D84, E31, G13, G51.

*University of Houston. Address: 4250 Martin Luther King Blvd, Houston, TX 77204. E-mail: jtbeatty@bauer.uh.edu.

†University of Houston. Address: 4250 Martin Luther King Blvd, Houston, TX 77204. E-mail: hitzemann@bauer.uh.edu. Web: http://www.steffenhitzemann.com.

1 Introduction

Inflation expectations are closely followed by policy-makers, practitioners, and scholars in economics and finance. For instance, policy-makers analyze the inflation expectations of households to assess the effectiveness of monetary and fiscal policies, and similarly, inflation expectations play a role in firm decision making and asset pricing (Coibion et al. 2019). It is widely acknowledged that both high inflation and deflation (i.e., negative inflation) are associated with negative general economic outcomes. Importantly, recent research emphasizes that the expectations themselves centrally drive the state of the economy, that is, it is critical for policy-makers to account for consumer's inflation expectations even if they happen to be biased and heterogeneous.

While the literature mainly focuses on the role of inflation expectations in connection with high-inflation scenarios, the case of high perceived deflation risk is still much less understood. One of the reasons is that generally, the risk of deflation is estimated to be very low due to the strong commitment of policy-makers to avoid such a scenario. Interestingly, this changed during the recent high-inflation period: Besides a considerable part of the population expecting continued high inflation, a significant fraction also started to expect *deflation* over the horizon of the next three years.[1] For example, in August 2022, with a prevailing CPI inflation rate of 8.5%, individuals assigned on average a more than 28% percent probability to the scenario of a deflation over the next three years. The increased perceived probability of future deflation is reflected by a more and more pronounced negative skewness of consumers' inflation expectations, suggesting that this pattern is not just driven by high uncertainty (second-moment) effects. This unique scenario — which contrasts with

[1] Armantier et al. (2023) also document this pattern and show that it is challenging to explain it within a standard learning model of inflation expectations.

the previous observation of a "zero lower bound" on inflation expectations (Gorodnichenko and Sergeyev, 2021) — allows us to analyze, on the one hand, what factors contribute to the high perceived probability of deflation, and on the other hand, how the perceived deflation risk interacts with individuals' general expectations about the economy.

We start off our analysis by investigating whether the high probabilities assigned to a deflation scenario are specific to consumer expectations, or whether economic analysts and investors anticipate a high deflation risk as well. To this end, we first compare the consumer expectations to outcomes of the Survey of Professional Forecasters, and second, we extract market-implied deflation probabilities from the market for inflation options. We find that the probability assigned to a deflation scenario is much lower for both the professional forecasters and the option-implied probabilities compared to consumer expectations. For example, the professional forecasters assign a probability of around 13% to a deflation over the next two years in August 2022, and market investors expect deflation over the next three years with less than 11%. Moreover, the increased negative skewness associated with the deflation tail is unique to consumer expectations; in contrast, inflation probability distributions from professional forecasters or option prices over two or three-year horizons, respectively, exhibit a positive skewness throughout our sample.

Building on this setting, we ask the question what explains these increased deflation expectations. We first analyze whether the high perceived deflation risk is particularly prevalent within specific demographic groups. The available microdata allow us to identify the age group, education, numeracy, and income of the surveyed individuals. Our main finding across all demographic attributes is that while different demographic groups assign different *baseline* probabilities to a deflation scenario, the dramatic increase in perceived deflation risk after 2021 is similarly pronounced across all demographic groups. As an example, we find

that young individuals and individuals with lower income, numeracy, or levels of education generally perceive a higher deflation probability than the rest of the population throughout or sample. However, while the perceived deflation risk considerably increases in the average population after 2022, there is no significant difference in this increase for any of these demographic groups.

We next want to understand whether other individual factors are strongly associated with the increase in perceived deflation risk. Similar to our results on demographic groups, we find that there are factors driving a generally higher *baseline* probability that individuals assign to deflation. Precisely, our results indicate that individuals who are employed full time or who are retired generally assign a lower probability to future deflation, while individuals whose financial situation has considerably worsened over the past year or who anticipate difficulties obtaining a loan tend to assign a higher probability to future deflation. However, none of these factors is significantly associated with the general increase of perceived deflation risk in the average population after 2022.

We proceed to analyze whether perceived deflation risk correlates with an expected decline or smaller increase in energy and food prices. We find that this is the case. Individuals expecting deflation also report a lower expectations of gas and food price increases and, particularly for food prices, this relation is significantly amplified in the after-2022 period. This finding has important implications, as it shows that respondents' price expectations for individual goods are broadly consistent with their reported inflation or deflation expectations, and that products that are covered by headline inflation but not by core inflation contribute significantly to individuals' perceived deflation risk.

Next, we explore what general expectations individuals who perceive a high probability of a future deflation have about the general economy. First, we want to understand whether individuals' perceived deflation risk is associated with a worsening of general expectations of the economy. While in theory, a deflation scenario could be either the cause or the result of a recession, this would either way suggest that individuals who expect a deflation with high probability also expect worse economic outcomes on average. We find that this is not the case. Our results suggest that individuals with high perceived deflation risk assign a lower probability to an increased unemployment rate than the general population, and they assign a lower probability to losing their individual job particularly in the recent period after 2022. We also find no evidence of individuals with high perceived deflation risk expecting a decline of their individual earnings or of their household income over the next year.

In addition to economic expectations, the available microdata also allows us to analyze the anticipated actions of individuals who expect future deflation with a high probability. In particular, we evaluate to what extent individuals' answer to the question on whether they expect their household spending to increase or decrease in the next 12 months is related to their perceived deflation risk. We find that individuals with high deflation risk generally expect their household spending to increase less than the general population. The effect is significant for our overall sample and slightly weaker, but still negative, for the recent increase in perceived deflation probabilities after 2021.

Overall, our results suggest that individuals do not associate worse economic outcomes with increased deflation probabilities. While negative effects of deflation are widely recognized, Bordo et al. (2009) and Borio et al. (2015) point out that not every deflation in history has led to a worsening of general economic conditions. At the same time, it is quite possible that individuals do not incorporate the potential negative equilibrium effects of deflation

when forming their expectations. In particular, we find that individuals perceiving a high deflation risk anticipate lower spending compared to other households, which is a critical ingredient for the standard theory of deflation spirals. Similarly, we also find individuals assigning a high probability to future deflation anticipate declining home prices, which are at the center of the debt deflation mechanism. Our findings can be interpreted as evidence of individuals seeing deflation from a partial equilibrium perspective, without anticipating or incorporating its general equilibrium consequences.

Related literature Our paper contributes to several strands of literature. First, there is a fast-growing recent literature that aims to understand the formation of individual inflation expectations. Contrasting with the classical doctrine of rational expectations (Muth, 1961; Lucas, 1972), this literature shows that household expectations of inflation tend to be more heterogeneous than those of professional forecasters, for example, which implies that the mechanism for how individuals form their inflation expectations is quite different. Important contributions in this area find that individuals form their expectations based on their personal experiences as consumers; these experiences are diverse, subject to biases, and are inconsistent with the framework of rational expectations (Malmendier and Nagel, 2016). For instance, individuals likely recall recent price changes to frequently purchased goods (such as food and gas) in order to forecast aggregate inflation (Cavallo et al., 2017; D'Acunto et al., 2021). Other papers provide evidence that the wide dispersion of individual forecasts is the result of rational inattention; that is, individuals have limited information storing and processing capabilities and the cost of acquiring the correct inflation forecast is expensive relative to the benefits of using it (Cornand and Paul, 2022). This literature does not have a strong focus on expectations of deflation due to the fact that the probability of such scenario

used to be very low in most historical datasets. The recent substantial increase of perceived deflation risk in consumer expectations allows us to complement and contribute to this literature by investigating the drivers and consequences of household deflation expectations. By doing so, we also complement approaches analyzing inflation and deflation probabilities from inflation derivatives (Kitsul and Wright, 2013; Fleckenstein et al., 2017; Hilscher et al., 2022; Mertens and Williams, 2021; Bruin et al., 2023).

Second, the relation between deflation and other macroeconomic outcomes is at the center of an important strand of research. Most monetary authorities prefer that the economy experiences gradual inflation over time (Bernanke and Carey, 1996), which implicitly indicates that deflation is less desirable. Historically, the link between deflation and recession goes back to the Great Depression, as formalized by Fisher (1933). Some authors challenge the notion of an unambiguous link between deflation and recession (e.g., Cole and Ohanian, 2004). Atkeson and Patrick (2004) argue that there is virtually no systemic link between deflation and recession, and that policy-makers' fear of policy-induced deflation is greatly overblown. Other researchers suggest that the relation is more ambiguous, arguing that a deflationary spiral only arises in the specific case when deflation is caused by a negative demand shock when the aggregate supply curve is vertical (Bordo et al., 2009). Borio et al. (2015) greatly narrow the scope of debt deflation, finding no evidence that debt deflation affects broader economic output; but do find that debt deflation is damaging to asset prices. Our paper adds to this literature by investigating consumers' expectations related to a deflation scenario. In particular, our analysis is silent on whether or not a deflation may or may not trigger a recession, but rather focuses on consumers' beliefs about such scenario.

Third, by analyzing the relation of deflation expectations to individuals' expectations of general economic outcomes, we add to the literature on individuals' inflation expectations

and their actions. Coibion, Gorodnichenko and Weber (2023) highlight that individuals act on their expectations of economy, which makes it critically important to analyze and understand individuals' expectations conveyed through surveys such as the Survey of Consumer Expectations. Nevertheless, there is no consensus in the empirical literature on how these inflation expectations effect consumption. For instance, the analysis by Burke and Ozdagli (2023) suggests that the link between consumption and expectations is not consistent and varies across demographic groups. Our paper adds to understanding this link from the perspective of an expected deflation scenario and the link of perceived deflation risk to various economic outcomes and expectations.

2 Perceived Deflation Risk in Consumer Expectations

We investigate consumers' inflation expectations based on the Survey of Consumer Expectations (SCE) conducted by the Federal Reserve Bank of New York. The SCE is a monthly survey where a rotating panel of approximately 1,300 households submit their expectations on various economic outcomes, including inflation. It was launched in 2013, and our dataset runs from the date of the launch until February 2023. The survey collects three pieces of information on inflation expectations from each respondent: (i) whether the respondent thinks there will be inflation or deflation, (ii) a point estimate for the expected inflation rate, and (iii) the probability that the respondent assigns to different inflation bins.[2] The individuals are asked for their expectations on the one hand for the next 12 months (1-year expectations), and on the other hand for the time period between 24 and 36 months in the

[2]In particular, respondents are asked to assign probabilities to the scenario of inflation or deflation (defined as negative inflation) being 12% or higher, between 8 and 12%, between 4 and 8%, between 2 and 4%, or between 0 and 2%.

future (3-year expectations). In addition, the survey collects consumers' expectations on the economic outlook as well as information regarding their personal current and expected future situation. Table A.1 in the appendix provides an overview of the different survey questions which are considered in the analysis of this paper. We utilize these data to document the rise in perceived deflation risk in the recent past and to understand its causes and potential economic effects.

2.1 The Deflation Tail in Consumer Expectations

We start our analysis by focusing on part (iii) of the collected information on consumer inflation expectations, the reported probability distribution of different inflation scenarios. We take the cross-sectional averages of the individually reported distributions for each month of our sample period, and plot the resulting probability densities for selected dates within our sample in Figure 1.[3] For better illustration, we have first reduced the probability distribution to four bins: $(-\infty, 0)$, $(0, 2)$, $(2, 4)$, and $(4, \infty)$, corresponding to deflation, mild inflation below and above the inflation target, and high inflation.

The figures suggest that during most times of our sample, the mass is to a great extent concentrated either on high-inflation scenarios or on scenarios around the target inflation rate of 2%. The assigned probability of deflation was comparably low before 2022, hovering around 17%. The picture is very different for the consumer inflation expectations in August 2022. Here, a probability of close to 29% is assigned to a deflation scenario, about as much

[3] We remove observations from our dataset for which the individual's inflation density does not sum to 100%, which is the case for only a small number of observations. If an individual has missed to report a value for some of the inflation bins, these values are set to zero as long as the overall reported density sums up to 100%.

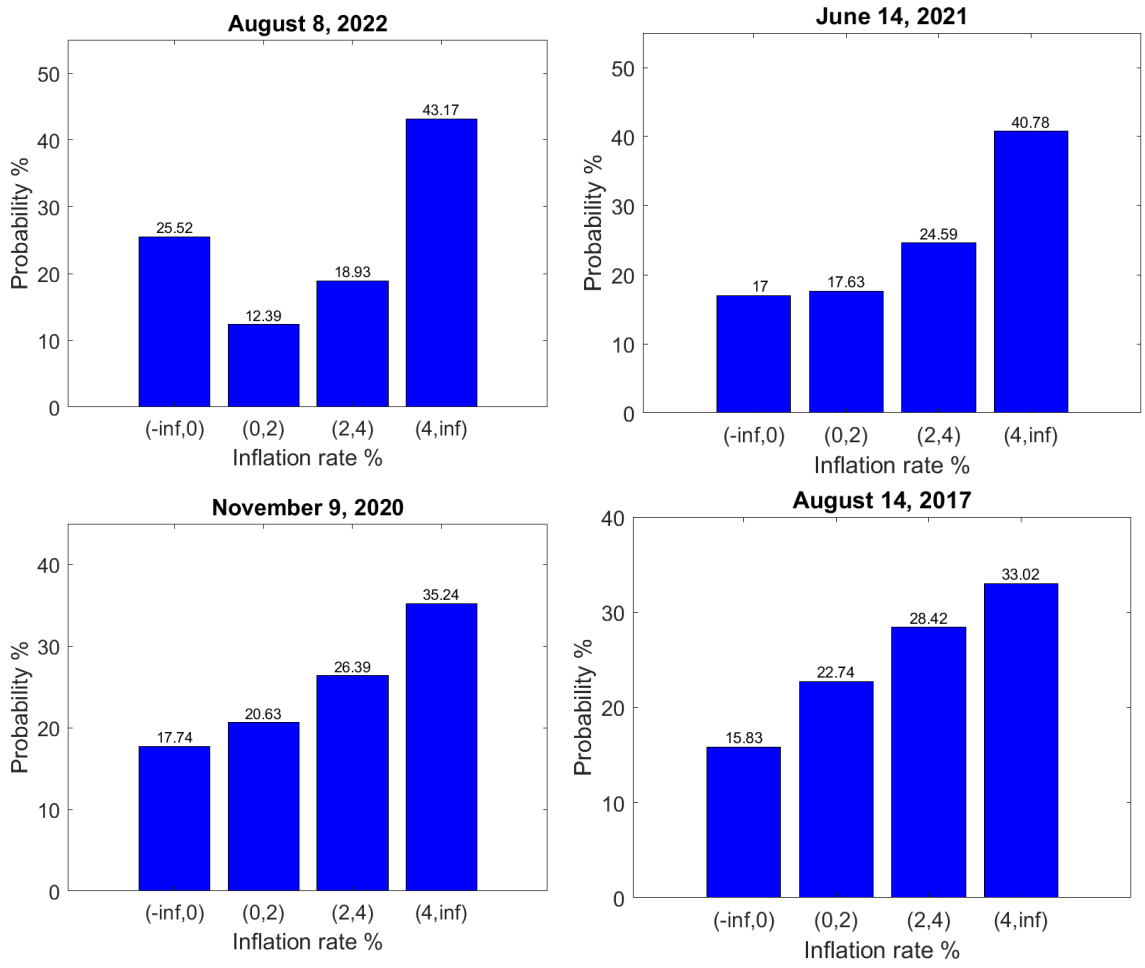


Figure 1: This figure shows individuals' perceived probability of different inflation outcomes 3 years ahead, as determined by the responses to the Survey of Consumer Expectations. Each survey respondent assigns probabilities of future inflation scenarios to the bins $(-\infty,-12)$, $(-12,-8)$, $(-8,-4)$, $(-4,-2)$, $(-2,0)$, $(0,2)$, $(2,4)$, $(4,8)$, $(8,12)$, and $(12,\infty)$ percent. We plot, for four selected dates, the inflation probabilities, averaged across all survey respondents within our sample and combined into the four bins $(-\infty,0)$, $(0,2)$, $(2,4)$, and $(4,\infty)$. The bin $(-\infty,0)$ stands for the average perceived probability of a deflation scenario.

as to moderate inflation between 0 and 4%, resulting in a distribution where respondents see high risks of both a high-inflation and a deflation scenario.

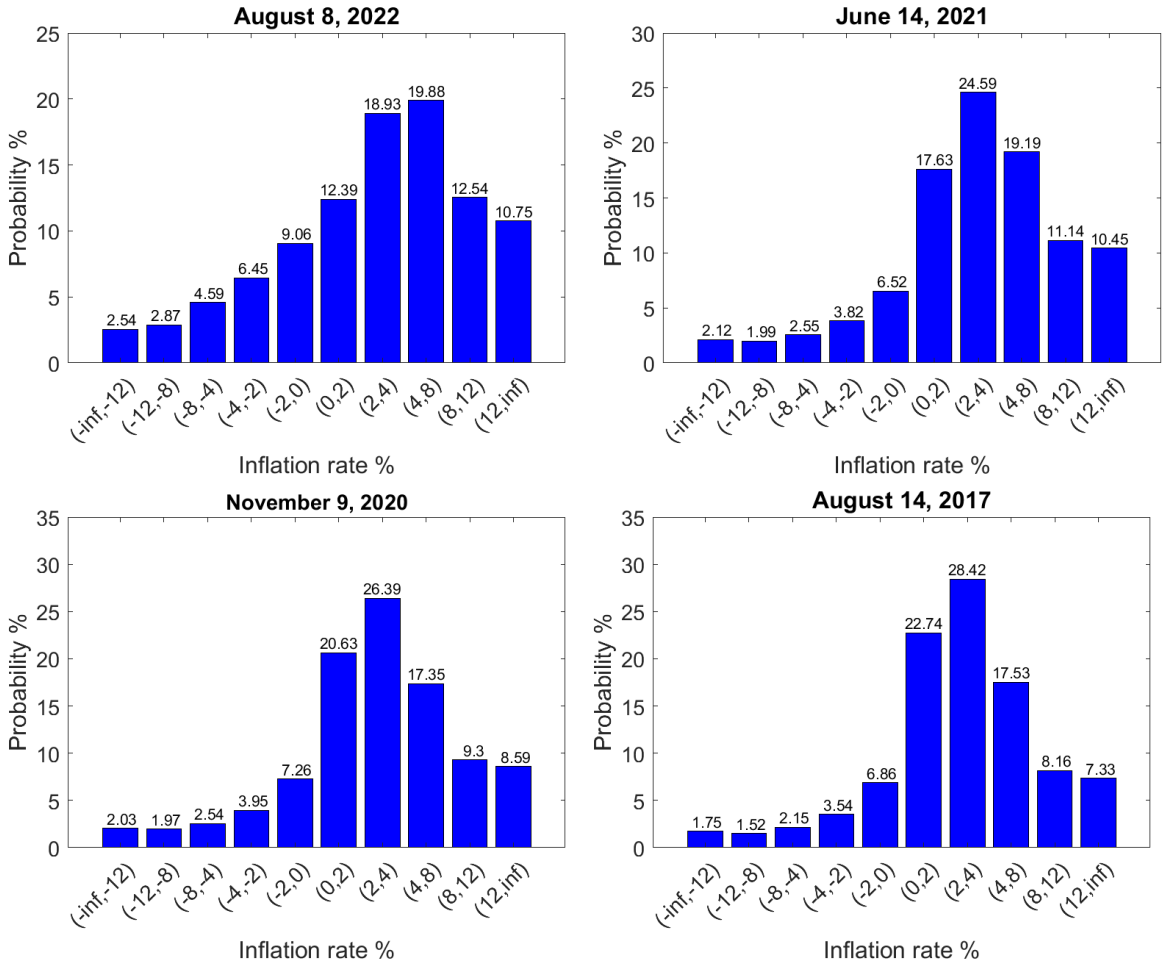


Figure 2: This figure shows individuals' perceived probability of different inflation outcomes 3 years ahead, as determined by the responses to the Survey of Consumer Expectations. Each survey respondent assigns probabilities of future inflation scenarios to the bins $(-\infty,-12)$, $(-12,-8)$, $(-8,-4)$, $(-4,-2)$, $(-2,0)$, $(0,2)$, $(2,4)$, $(4,8)$, $(8,12)$, and $(12,\infty)$ percent. We plot, for four selected dates, the inflation probabilities, averaged across all survey respondents within our sample. The bin $(-2,0)$ and the bins left of that stand for the average perceived probability of different deflation scenarios.

When investigating this pattern in detail by separately plotting all bins — $(-\infty,-12)$, $(-12,-8)$, $(-8,-4)$, $(-4,-2)$, $(-2,0)$; $(0,2)$, $(2,4)$ and $(4,8)$, $(8,12)$, $(12,\infty)$ — in Figure 2, we observe that a pronounced "deflation tail" has evolved over time. We argue that this pattern is very remarkable since it is unique in the history of our sample that respondents

assign such high probabilities to a deflation scenario, and, in addition, this happens during a time when the prevailing inflation rate is clearly above the 2% inflation target.

To benchmark and further evaluate this trend, we proceed to compare it to the densities elicited in the Survey of Professional Forecasters, as well as the densities computed from the zero-coupon inflation caps and floors.

2.2 Comparison to Professional Inflation Forecasts

We obtain professional inflation forecasts from the Survey of Professional Forecasters, conducted by the Federal Reserve Bank of Philadelphia. Similar to the SCE, respondents are asked the percent chance that the rate of inflation would be in the following ranges: (-∞,0), (0,0.5), (0.5,1), (1,1.5), (1.5,2), (2,2.5), (2.5,3), (3,3.5), (3.5,4), (4,∞). Important differences to the SCE are, besides the fact that the respondents are professional forecasters, that the considered horizons are 12 months and 2 years ahead, and the forecasted inflation rate is *core* CPI inflation (based on the CPI less food and energy).

We plot the densities for professional forecasters in a manner identical to the household data by aggregating the data to four bins, and show the plots for the same four selected dates in Figure 3 for the 2-year ahead forecast. It becomes directly apparent that the greatest mass (more than 80%) on all dates falls on the interval between 0 and 4%. While the deflation probability is elevated in 2022 compared to the previous years, it is below 14% and therefore less than half of that estimated by the consumers. Plotting all reported bins in detail in Appendix Figure C.1 confirms the stark difference between the consumer expectations and the professional forecasts.

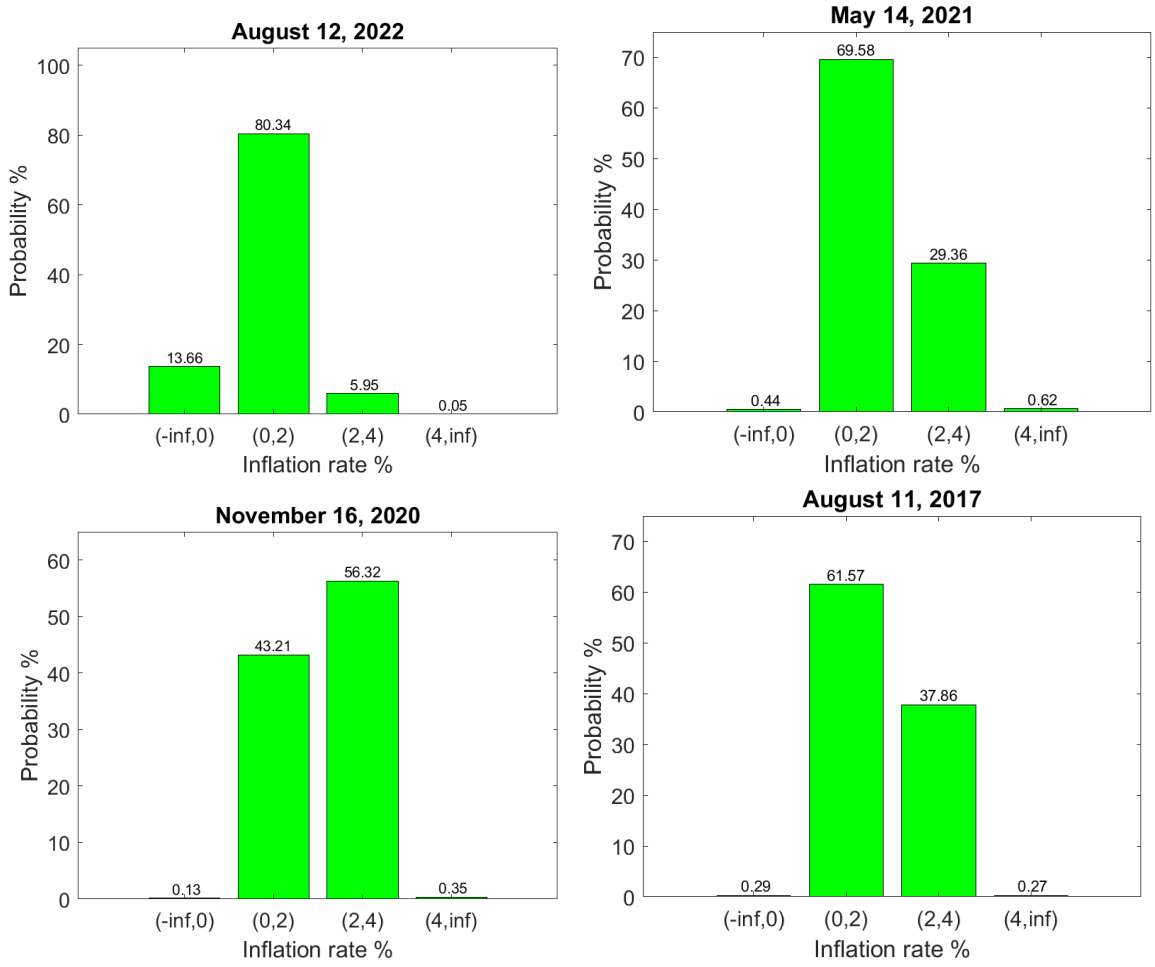


Figure 3: This figure shows professional forecasters' perceived probability of different core CPI inflation outcomes 2 years ahead, as determined by the responses to the Survey of Professional Forecasters. Each survey respondent assigns probabilities of future inflation scenarios to the bins $(-\infty,0)$, (0,0.5), (0.5,1), (1,1.5), (1.5,2), (2,2.5), (2.5,3), (3,3.5), (3.5,4), and $(4,\infty)$ percent. We plot, for four selected dates, the inflation probabilities, averaged across all survey respondents within our sample and combined into the four bins $(-\infty, 0)$, $(0, 2)$, $(2, 4)$, and $(4, \infty)$. The bin $(-\infty, 0)$ stands for the average perceived probability of a deflation scenario.

There are two possible explanations for these differences. First, it is possible that the high deflation risk perceived by the consumers is attributable to expected declines in food and energy prices, which are not considered in the Survey of Professional Forecasters. We analyze this possibility in Section 3.3. Second, it is possible that these differences are explained by different information available to consumers versus professional forecasters and by potential biases in their expectation formation. Before we proceed to investigate their expectation formation with respect to the deflation tail in detail, we consider an additional benchmark of comparison that we obtain from the market of inflation options.

2.3 Comparison to Option-Implied Inflation Predictions

Employing data on zero-coupon inflation caps and floors, we extract market-implied probabilities of different inflation scenarios (see Kitsul and Wright, 2013). Quotes on inflation options were obtained from Bloomberg and are available for maturities of 1, 2, 3, 4, 5, 7, 10, 12, 15, 20 and 30 years, and at strikes of -2, -1, -0.5, 0, 0.5, 1, 1.5, 2, 2.5 and 3 percent for floors and 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 6 percent for caps. The market for caps and floors has grown significantly over the past decade and offers insights on the market's assessment of future inflation outcomes.

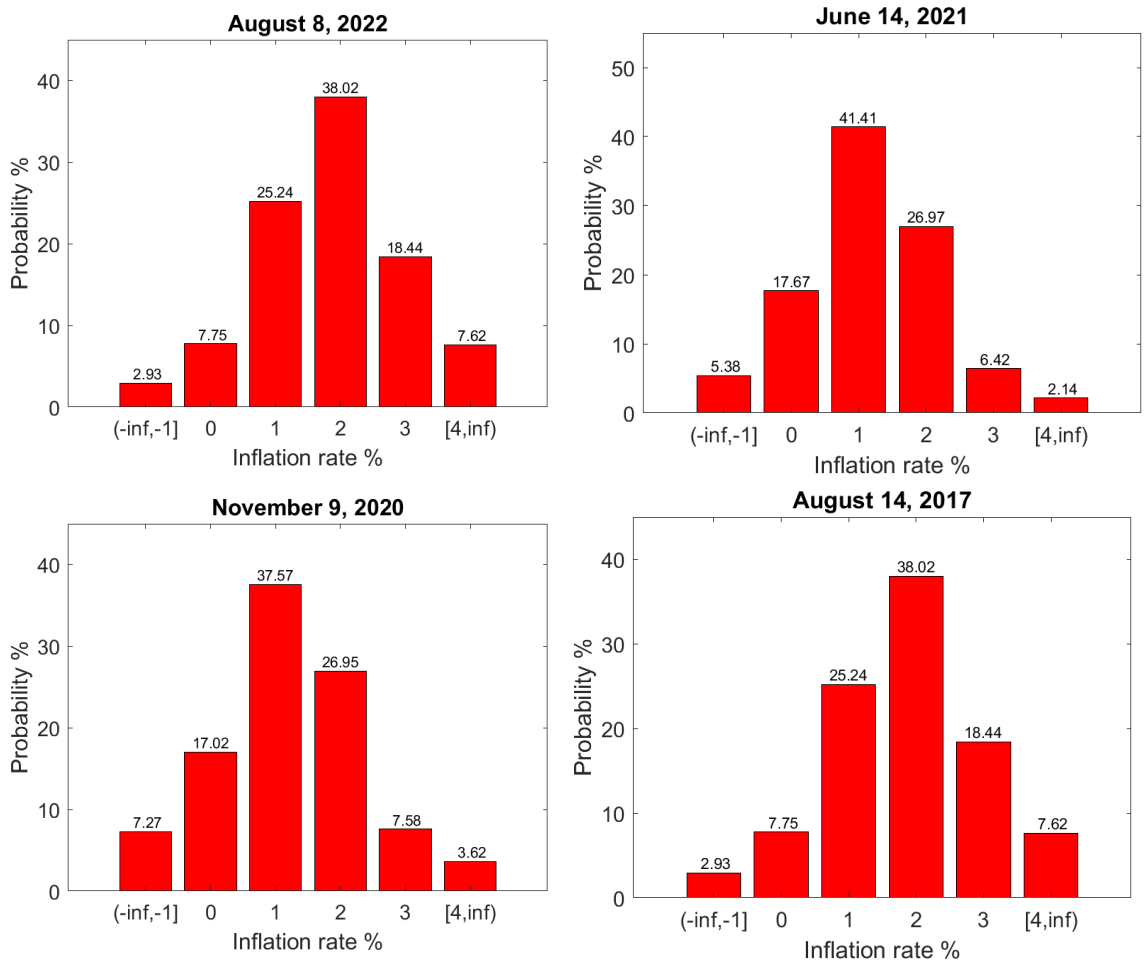


Figure 4: This figure shows option-implied risk-neutral probabilities of different inflation outcomes 3 years ahead. The probabilities were computed based on zero-coupon inflation caps and floors using the butterfly method, which attributes the implied probabilities to full-integer inflation rates. We plot, for four selected dates, the option-implied inflation probabilities, combined to the bins and values $(-\infty, -1)$, 0, 1, 2, 3 and $(4, \infty)$ percent. The bin $(-\infty, -1)$ stands for the option-implied probability of a deflation scenario.

We extract option-implied inflation probabilities using the "butterfly-portfolio" method (Breeden and Litzenberger, 1978), which allows to approximate the inflation probability over n years by assuming only integer support. Note also that the option-implied probabilities are with respect to the risk-neutral measure, which takes into account risk premia and

thus assigns greater probabilities to the tails of the distribution compared to the real measure; therefore, the option-implied probabilities can be interpreted as an "upper bound". Nevertheless, Figure 4 shows very clearly that even the risk neutral-densities have much smaller deflation tails than those reported in the Survey of Consumer Expectations. The option-implied inflation densities are more symmetric and have overall smaller tails than the SCE data, indicating that the options market does not see a significant deflation risk in the medium term, in contrast to the high deflation risk perceived by consumers.

2.4 Skewness of Inflation Densities over Time

We finally emphasize the distinct pattern in consumer inflation expectations in terms of the pronounced deflation tail that has evolved by computing and investigating the density skewness over time. Figure 5 plots the skewness of the SCE densities for 1- and 3-year horizons over time, alongside the skewnesses for the professional forecast and the option-implied densities.

Especially for the 3-year horizon, the difference between the inflation expectations of consumers on the one side and professional forecasters and investors on the other side becomes very evident. While professional forecasters and option-implied densities are positively skewed throughout the sample, indicating a low mass on deflation scenarios, the skew of the SCE densities is close to zero most of the time but has become clearly negative towards the end of the sample.

Besides reflecting the pronounced deflation tail from a statistical perspective, the analysis of the skewness also confirms that the high deflation probability in consumer expectations is not merely a result of high uncertainty (i.e., an increased standard deviation of expectations).

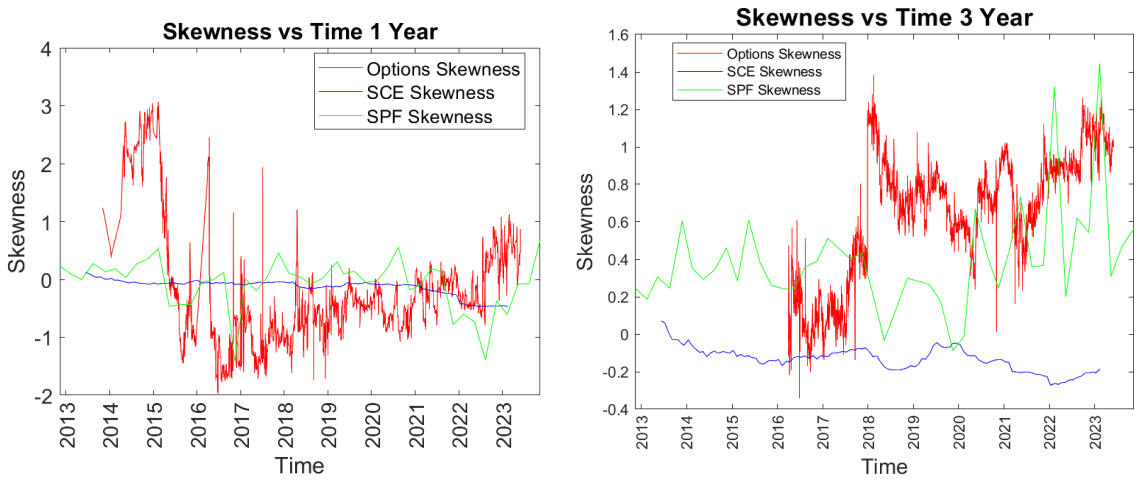


Figure 5: This figure plots the skewness of the inflation probability density for consumers, professional forecasters, and implied from inflation options, over time. For each point in time, we consider the perceived probability distribution of future inflation scenarios from the Survey of Consumer Expectations and from the Survey of Professional Forecasters, averaged across respondents, and compute its skewness. We also calculate the skewness of the option-implied risk-neutral probability density for each point in time. The left plot shows the different time series of skewness for 1-year ahead inflation probabilities, the right plot based on 3-years ahead inflation probabilities.

Instead, the observed patterns suggest that the deflation tail arises from factors that are specific to consumers' expectation formation. We utilize this unique setting — a scenario of high perceived deflation risk in times of moderate to high inflation — to analyze and understand the causes and effects of deflation expectations in detail.

3 Drivers of Perceived Deflation Risk

We first analyze what drives perceived deflation risk. In particular, we ask whether there particular demographic groups by age, education, age, or numeracy, to which the increase in deflation probabilities can be attributed to. Then we extend our analysis to individual factors, such as respondents recent and near-term credit and finance situation. Finally, we ask

to what extent individuals' perceived deflation probabilities coincide with their expectation of the price changes in different product groups, such as gas and food.

3.1 Analysis of Different Demographic Groups

We formally investigate if the increase in deflation expectations can be attributed to a particular demographic group based on age, education, income, or numeracy. To begin with, Figure 6 illustrates the percentage of individuals in each revelant demographic group expecting a deflation over a 3-year horizon. The plots suggest, first, that the baseline level of perceived deflation probabilities differs across demographic groups. For example, respondents with higher education and respondents over 60 years of age assign a lower probability to a deflation scenario compared to lower-education respondents and those who are younger than 60 years. Second, the figures indicate that the substantial rise in perceived deflation risk starting in 2022 is driven by all demographic groups across the board.

We formally analyze these observations by means of panel regressions in Table 1, regressing the individual's reported probability of deflation on the different demographic attributes age, education, numeracy, and income. In these and in all of our regressions throughout the paper, we analyze the baseline effect for our whole sample as well as the separate effect in the period after and including the year 2022, in which high deflation probabilities and the pronounced deflation tail have developed. The results confirm that, indeed, the baseline deflation probabilities exhibited by different demographic groups are significantly different from each other. This effect is, however, counteracted after 2022, implying that the increased perceived deflation risk after that time is equally driven by all demographic groups. For example, respondents with some college education generally exhibit a 4.26% lower defla-

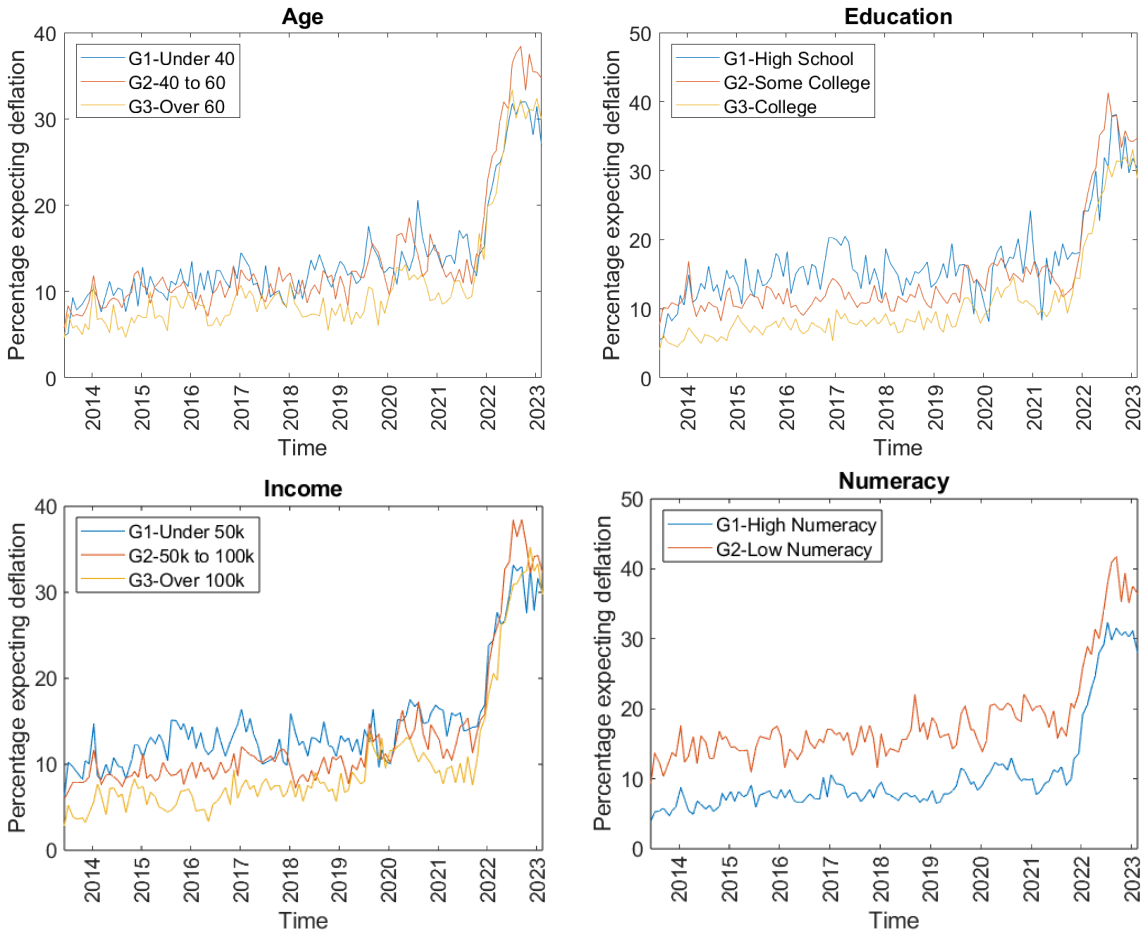


Figure 6: This figure shows the percentage of individuals who expect a future deflation scenario for different demographic groups by age, education, income and numeracy. For each demographic group, we calculate the percentage of survey respondents in that group indicating that they expect a deflation 3 years ahead, when being asked whether they expect an inflation or a deflation. The plots illustrate how the percentage of individuals in each group who expect a deflation evolves over time.

Table 1: Demographic Attributes and Deflation Expectations

The table reports panel regressions of individuals' three-year deflation expectations on dummy variables for their demographic groups with respect to age, education, numeracy, and income. The lowest value for the respective demographic attribute is omitted in each regression: "under 40", "high school", "low numeracy", "under 50K". We include an "After 2022" dummy which is one for all observations in January 2022 or later, and interact it with the demographics dummies. Columns (1)–(4) are panel regressions in which the dependent variable is the individuals' perceived deflation probability, aggregated from all bins that stand for a less-than-zero inflation. Columns (5)–(8) are logistic panel regressions in which the dependent variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0). Standard errors are double-clustered by household and survey date.

	(1) Defl. Prob.	(2) Defl. Prob.	(3) Defl. Prob.	(4) Defl. Prob.	(5) Defl. Ind.	(6) Defl. Ind.	(7) Defl. Ind.	(8) Defl. Ind.
After 2022	0.0793***	0.0867***	0.0941***	0.0912***	1.066***	0.902***	1.009***	1.044***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age 40-60	-0.0201***				-0.0764*			
	(0.000)				(0.073)			
Age 60+	-0.0486***				-0.377***			
	(0.000)				(0.000)			
Age 40-60 × After 2022	0.0298**				0.297***			
	(0.026)				(0.001)			
Age 60+ × After 2022	0.0429***				0.378***			
	(0.002)				(0.000)			
Some College		-0.0426***				-0.225***		
		(0.000)				(0.000)		
College		-0.0827***				-0.645***		
		(0.000)				(0.000)		
Some College × After 2022		0.0362**				0.395***		
		(0.046)				(0.001)		
College × After 2022		0.0113				0.514***		
		(0.491)				(0.000)		
High Numeracy			-0.0869***				-0.770***	
			(0.000)				(0.000)	
High Numeracy × After 2022			0.0120				0.452***	
			(0.277)				(0.000)	
Income 50-100k				-0.0351***				-0.220***
				(0.000)				(0.000)
Income 100k+				-0.0619***				-0.546***
				(0.000)				(0.000)
Income 50-100k × After 2022				0.0283**				0.354***
				(0.042)				(0.000)
Income 100k+ × After 2022				0.0211				0.511***
				(0.111)				(0.000)
Constant	0.178***	0.214***	0.217***	0.185***	-2.011***	-1.746***	-1.648***	-1.934***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	149241	148921	149264	147851	151177	150864	151204	149755

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

tion probability than respondents with no college education; starting in 2022, however, the perceived deflation probability increased more strongly for respondents with some college education, alleviating the difference between the two groups. Overall, our results show that the recent rise in deflation expectations is broadly present across all demographic groups.

3.2 Individual Factors

We next investigate whether factors related to the respondents' individual economic and financial situation can explain the recent rise in perceived deflation risk. For instance, one could hypothesize that individuals who have suffered financial setbacks would be more likely to assign a higher probability to deflation. We particularly consider the respondents' employment status (full time, part time, looking for work, etc.), their recent credit and financial situation, and their near-term credit and finance expectations, and analyze this question employing the panel regression setup as before.

The results on the relation of employment status to perceived deflation risk reported in Table 2 support the view that people who are employed, especially full-time, assign a lower probability to a deflation scenario in our full sample. On the contrary, individuals who have been laid off, are on leave, or unable to work perceive higher deflation probabilities. While these effects can be observed over our whole sample, they are not much present for the time period of increased perceived deflation risk starting in 2022. In fact, most coefficients capturing this specific time period are either insignificant or in the opposite direction of the baseline effect, indicating that respondents' employment status is not strongly related to the recent rise of perceived deflation risk.

Table 2: Employment Status and Deflation Expectations

This table reports panel regressions of individuals' three-year deflation expectations on dummy variables for their employment status. The lowest value for the respective demographic attribute is omitted in each regression: "under 40", "high school", "low numeracy", "under 50K". We include an "After 2022" dummy which is one for all observations in January 2022 or later, and interact it with the demographics dummies. Columns (1)–(3) are panel regressions in which the dependent variable is the individuals' perceived deflation probability, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are logistic panel regressions in which the dependent variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0). We include demographic and state fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Defl. Prob.	(2) Defl. Prob.	(3) Defl. Prob.	(4) Defl. Ind.	(5) Defl. Ind.	(6) Defl. Ind.
Full time	-0.0205***	-0.0107**	-0.0107**	0.889*	0.960	0.965
	(0.000)	(0.042)	(0.041)	(0.055)	(0.517)	(0.574)
Part time	-0.00798	-0.00294	-0.00203	0.986	1.026	1.036
	(0.111)	(0.548)	(0.678)	(0.816)	(0.677)	(0.559)
Looking for work	0.0188**	0.0126*	0.0124*	1.237***	1.174**	1.176**
	(0.015)	(0.087)	(0.092)	(0.005)	(0.034)	(0.033)
Temp laidoff	0.0479***	0.0410***	0.0413***	1.517***	1.445***	1.457***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.005)	(0.004)
On leave	0.0509***	0.0385**	0.0383**	1.935***	1.795***	1.799***
	(0.003)	(0.036)	(0.036)	(0.000)	(0.000)	(0.000)
Unable work	0.0479***	0.0230***	0.0236***	1.393***	1.157*	1.173*
	(0.000)	(0.009)	(0.008)	(0.000)	(0.095)	(0.067)
Retiree	-0.0438***	-0.0137**	-0.0132**	0.712***	0.916	0.923
	(0.000)	(0.015)	(0.018)	(0.000)	(0.223)	(0.270)
Student	0.0269***	0.0127	0.0122	1.213**	1.143	1.136
	(0.002)	(0.127)	(0.141)	(0.024)	(0.122)	(0.144)
Homemaker	0.0374***	0.0262***	0.0264***	1.352***	1.253***	1.255***
	(0.000)	(0.001)	(0.001)	(0.000)	(0.004)	(0.004)
Other	0.0161*	0.0192**	0.0198**	1.141	1.179	1.184*
	(0.084)	(0.036)	(0.032)	(0.184)	(0.107)	(0.096)
After 2022	0.0863***	0.0731***	0.0789***	3.104***	2.938***	3.058***
	(0.000)	(0.002)	(0.001)	(0.000)	(0.000)	(0.000)
Full time × After 2022	0.0166	0.0281	0.0225	1.242	1.330*	1.288*
	(0.435)	(0.197)	(0.306)	(0.139)	(0.061)	(0.095)
Part time × After 2022	0.00667	0.0110	0.00580	1.066	1.093	1.056
	(0.747)	(0.602)	(0.784)	(0.660)	(0.555)	(0.715)
Looking for work × After 2022	0.0118	0.0184	0.0169	0.918	0.956	0.943
	(0.660)	(0.497)	(0.541)	(0.663)	(0.828)	(0.779)
Temp laidoff × After 2022	0.0174	0.0132	0.00767	0.999	1.019	0.953
	(0.743)	(0.809)	(0.888)	(0.996)	(0.956)	(0.882)
On leave × After 2022	-0.0149	-0.00424	-0.0112	0.432***	0.468**	0.449**
	(0.751)	(0.927)	(0.812)	(0.006)	(0.018)	(0.015)
Retiree × After 2022	0.0348	0.0406*	0.0340	1.407**	1.434**	1.384**
	(0.107)	(0.066)	(0.126)	(0.023)	(0.022)	(0.038)
Unable to work × After 2022	-0.0123	0.000551	-0.00782	0.709*	0.763	0.725
	(0.663)	(0.984)	(0.786)	(0.080)	(0.183)	(0.112)
Student × After 2022	0.0113	0.0160	0.00977	0.882	0.904	0.882
	(0.673)	(0.545)	(0.708)	(0.544)	(0.626)	(0.545)
Homemaker × After 2022	0.0158	0.0275	0.0249	0.937	1.014	0.995
	(0.578)	(0.332)	(0.390)	(0.730)	(0.945)	(0.980)
Other × After 2022	0.0229	0.0328	0.0296	1.285	1.374	1.339
	(0.597)	(0.452)	(0.498)	(0.300)	(0.216)	(0.269)
Constant	0.170***	0.160***	0.160***	0.126***	0.233***	0.282***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Observations	149324	147400	147071	151272	149292	148954

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Recent Finance Situation and Deflation Expectations

This table reports panel regressions of individuals' three-year deflation expectations on dummy variables for their perceived recent finance situation relative to 12 months ago. The lowest value ("much worse") for the perceived recent finance situation is omitted. We also include an "After 2022" dummy which is one for all observations in January 2022 or later, and interact it with the finance situation dummies. Columns (1)–(3) are panel regressions in which the dependent variable is the individuals' perceived deflation probability, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are logistic panel regressions in which the dependent variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0). We include demographic, state, and employment status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Defl. Prob.	(2) Defl. Prob.	(3) Defl. Prob.	(4) Defl. Ind.	(5) Defl. Ind.	(6) Defl. Ind.
Worse	-0.0306***	-0.0125*	-0.00675	-0.346***	-0.215***	-0.180**
	(0.000)	(0.080)	(0.351)	(0.000)	(0.002)	(0.011)
Equal	-0.0301***	-0.00913	-0.000614	-0.465***	-0.317***	-0.264***
	(0.000)	(0.218)	(0.935)	(0.000)	(0.000)	(0.000)
Better	-0.0275***	-0.00311	0.00651	-0.416***	-0.231***	-0.173**
	(0.000)	(0.683)	(0.399)	(0.000)	(0.002)	(0.023)
Much Better	-0.0146	0.00822	0.0176*	-0.132	0.0478	0.107
	(0.120)	(0.374)	(0.060)	(0.147)	(0.605)	(0.253)
After 2022	0.107***	0.114***	0.120***	1.057***	1.122***	1.163***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Worse × After 2022	-0.00703	-0.0136	-0.0182	0.159	0.135	0.113
	(0.691)	(0.443)	(0.301)	(0.159)	(0.256)	(0.347)
Equal × After 2022	0.000730	-0.00943	-0.0159	0.281**	0.228*	0.189
	(0.971)	(0.637)	(0.417)	(0.017)	(0.069)	(0.134)
Better × After 2022	0.00466	-0.00531	-0.0119	0.365***	0.306**	0.268**
	(0.833)	(0.810)	(0.581)	(0.004)	(0.021)	(0.045)
Much Better × After 2022	-0.0498**	-0.0559**	-0.0644**	-0.306*	-0.384**	-0.415**
	(0.050)	(0.033)	(0.013)	(0.096)	(0.046)	(0.031)
Constant	0.182***	0.161***	0.153***	-1.759***	-0.992***	-1.104***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	149248	147326	146997	151202	148885	148885

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3 relates respondents' perceived deflation risk to their recent finance situation. Interestingly, the results reveal that individuals who evaluate their recent financial situation to be in the extremes — both on the negative and on the positive side — assign a greater probability to deflation over the full sample. People whose financial situation is simply "worse", "equal", or "better", but not extreme, generally assign lower probabilities to a deflation scenario. This pattern is not significantly altered by the post-2022 period, except for the fact that individuals with a "much better" financial situation have a significantly lower perceived deflation probability for this subsample. Therefore, the increased perceived deflation risk starting in 2022 is most strongly driven by respondents who evaluate their personal financial situation to be "much worse". These results are broadly confirmed when analyzing individuals' recent credit situation as well as their near-term future financial and credit situation.

3.3 Gas and Food Price Expectations

We proceed to examine the relation between households' deflation expectations and their prediction of gas and food prices in the next 12 months. This analysis provides first evidence for the consistency of individuals' reported expectations, as high probabilities assigned to a deflation scenario should in theory be reflected by expected price declines (or at least lower price increases) for gas and food.

In Table 4, we run a panel regression of the individuals' expected gas price increase on the reported probability of deflation, on the one hand, and on the deflation yes-no dummy on the other hand. We include demographics, state, and employment-status fixed effects in our regression. The results show that a higher perceived probability of deflation is strongly

related to a lower expected gas price increase reported by the respondents, and the effect is highly statistically significant. Including all fixed effects, we obtain that a 10% higher deflation probability in the full sample coincides with an expected gas price change that is lower by 0.47%, and the effect does not change significantly after 2022.

Table 4: Deflation Expectations and Expected Gas Price Change

This table reports panel regressions of individuals' expected gas price change over the next 12 months on individuals' three-year deflation expectations. We also include an "After 2022" dummy, which is one for all observations in January 2022 or later, and interact it with the deflation expectation variables. Columns (1)–(3) are panel regressions in which the deflation expectation variable is the individuals' perceived deflation probability for a 3-year horizon, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are panel regressions in which the deflation expectation variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0) for a 3-year horizon. We include demographic, state, and employment-status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Gas	(2) Gas	(3) Gas	(4) Gas	(5) Gas	(6) Gas
After 2022	-1.428	-1.398	-1.470	-0.872	-0.820	-0.903
	(0.120)	(0.128)	(0.108)	(0.321)	(0.351)	(0.303)
Defl. Prob.	-4.311***	-4.591***	-4.679***			
	(0.000)	(0.000)	(0.000)			
Defl. Prob. × After 2022	-0.0834	0.103	0.121			
	(0.920)	(0.902)	(0.884)			
Defl. Ind.				-2.933***	-3.047***	-3.096***
				(0.000)	(0.000)	(0.000)
Defl. Ind. × After 2022				-1.424**	-1.354**	-1.348**
				(0.015)	(0.019)	(0.019)
Constant	8.141***	8.180***	8.200***	7.783***	7.791***	7.804***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	130331	128657	128367	131640	129940	129647

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

For food prices, Table 4 reveals that a 10% higher deflation probability in the full sample is accompanied by an expected food price change that is lower by 0.23%. In contrast to gas,

this effect is twice as strong in the high-deflation-risk period starting in 2022 as in the overall sample, suggesting that the perceived deflation risk is strongly related to lower food price expectations. Overall, our results confirm that perceived deflation probabilities are related to lower price change expectations for gas and food as reported by individuals.

Table 5: Deflation Expectations and Expected Food Price Change

This table reports panel regressions of individuals' expected food price change over the next 12 months on individuals' three-year deflation expectations. We also include an "After 2022" dummy, which is one for all observations in January 2022 or later, and interact it with the deflation expectation variables. Columns (1)–(3) are panel regressions in which the deflation expectation variable is the individuals' perceived deflation probability for a 3-year horizon, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are panel regressions in which the deflation expectation variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0) for a 3-year horizon. We include demographic, state, and employment-status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Food	(2) Food	(3) Food	(4) Food	(5) Food	(6) Food
After 2022	3.361***	3.486***	3.446***	3.599***	3.749***	3.710***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Defl. Prob.	-1.296***	-2.120***	-2.228***			
	(0.000)	(0.000)	(0.000)			
Defl. Prob. × After 2022	-2.576***	-2.252***	-2.163***			
	(0.000)	(0.000)	(0.000)			
Defl. Ind.				-0.610***	-1.133***	-1.191***
				(0.007)	(0.000)	(0.000)
Defl. Ind. × After 2022				-3.101***	-2.835***	-2.762***
				(0.000)	(0.000)	(0.000)
Constant	7.174***	7.279***	7.300***	7.082***	7.116***	7.127***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	130404	128730	128440	131717	130016	129723

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4 Perceived Deflation Risk and Economic Expectations

We investigate the relation between individuals' perceived deflation risk and their expectations on other dimensions of the state of the economy. The setting that we analyze is particularly suitable to address this issue, since it captures a period of unprecedentedly high perceived deflation risk during a time when the actual inflation rate in the economy was in fact very high. We first ask whether individuals associate a deflation scenario with worse economic outcomes, that is, a recession and high unemployment. Second, we analyze the relation between perceived deflation risk and household spending, which allows us to relate individuals' deflation expectations to their (planned) actions. Finally, we investigate the relation of respondents perceived deflation probabilities to their expectations on future house prices, which are at the center of a potential "debt deflation" channel.

4.1 Is Perceived Deflation Risk Associated with Worse Economic Outcomes?

We first analyze whether individuals associate high perceived deflation risk with worse future economic outcomes. According to the classical "deflation spiral" theory, a deflation leads to purchases of goods and services being postponed, depressing economic growth and ultimately employment and income. Along these lines, we investigate the relation between people's deflation expectations and their expected change of the unemployment rate in the future. Table 6 reports the results of a panel regression of individuals' reported probability of an

Table 6: Deflation Expectations and Perceived Probability of Increasing Unemployment

This table reports panel regressions of individuals' perceived probability that the unemployment rate will increase over the next 12 months on individuals' three-year deflation expectations. We also include an "After 2022" dummy, which is one for all observations in January 2022 or later, and interact it with the deflation expectation variables. Columns (1)–(3) are panel regressions in which the deflation expectation variable is the individuals' perceived deflation probability for a 3-year horizon, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are panel regressions in which the deflation expectation variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0) for a 3-year horizon. We include demographic, state, and employment-status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Unempl.	(2) Unempl.	(3) Unempl.	(4) Unempl.	(5) Unempl.	(6) Unempl.
After 2022	4.140***	4.077***	4.081***	3.851***	3.800***	3.791***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
Defl. Prob.	-1.598***	-1.325**	-1.445**			
	(0.006)	(0.021)	(0.012)			
Defl. Prob. × After 2022	-4.184***	-4.134***	-4.162***			
	(0.002)	(0.002)	(0.001)			
Defl. Ind.				-1.746***	-1.508***	-1.571***
				(0.000)	(0.002)	(0.002)
Defl. Ind. × After 2022				-2.161**	-2.226**	-2.186**
				(0.032)	(0.026)	(0.026)
Constant	37.52***	37.49***	37.49***	37.46***	37.46***	37.45***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	149029	147108	146779	150966	148989	148657

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

increase in unemployment on their perceived probability of deflation and the deflation yes-no-indicator, respectively.[4]

Contrasting with the classical theory, we find that individuals assigning a high probability to a deflation scenario are significantly less likely to expect an increase in unemployment.

[4] As Comerford (2023) points out, using information from the yes-no-indicator can have advantages over the perceived probability of deflation, and we use both measures to assess the role of deflation expectations and to ensure the robustness of our results.

This effect is in the same direction and strongly amplified during the recent period of high perceived deflation risk starting in 2022. In particular, a 10% higher perceived deflation probability corresponds to a 0.42% lower assigned probability over higher future unemployment. Interestingly, the result is slightly different when considering individuals' expectations about their own personal job security in Table 7 as opposed to macroeconomic unemployment. Over our whole sample, high perceived deflation risk is associated with a higher perceived risk of losing one's own job. However, this relation is again reversed in the high-deflation-risk period after 2022, such that we can overall conclude that individuals associate a deflation with lower unemployment and particularly in the after-2022 period with higher personal job security.

We next examine the relation of perceived deflation risk to individuals' expected future earnings and overall income. Associating a deflation scenario with an economic downturn would suggest significantly lower income expectations for those individuals with a high perceived deflation risk. Our results in Tables 8 and 9 show that there is no significant relation between deflation risk and future earnings and income in individuals' expectations. Focusing on the period of high perceived deflation starting in 2022 particularly shows that the combined effect of the baseline effect over the whole sample and the incremental effect over this special period almost entirely cancel out to zero. Altogether, we find that individuals do not connect a deflation scenario with lower (or higher) future earnings or income.

Finally, we ask to what extent the perceived probability of a deflation scenario is related to higher or lower stock returns according to individual's expectations. If people connect a deflation scenario with an economic recession, they would expect lower stock returns realized in such a scenario. On the other hand, our previous results suggest that individuals do not link deflation to a recession state as they expect lower unemployment in a deflation state.

Table 7: Deflation Expectations and Perceived Personal Job Insecurity

This table reports panel regressions of individuals' perceived probability of losing their job over the next 12 months on individuals' three-year deflation expectations. We also include an "After 2022" dummy, which is one for all observations in January 2022 or later, and interact it with the deflation expectation variables. Columns (1)–(3) are panel regressions in which the deflation expectation variable is the individuals' perceived deflation probability for a 3-year horizon, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are panel regressions in which the deflation expectation variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0) for a 3-year horizon. We include demographic, state, and employment-status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Prob. Los.	(2) Prob. Los.	(3) Prob. Los.	(4) Prob. Los.	(5) Prob. Los.	(6) Prob. Los.
After 2022	-2.736***	-2.502***	-2.354***	-2.588***	-2.366***	-2.278***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Defl. Prob.	1.675***	1.354***	1.087**			
	(0.001)	(0.005)	(0.018)			
Defl. Prob. × After 2022	-2.532***	-2.311**	-2.513***			
	(0.008)	(0.015)	(0.006)			
Defl. Ind.				0.311	0.0880	-0.156
				(0.454)	(0.828)	(0.689)
Defl. Ind. × After 2022				-2.151***	-1.874***	-1.778***
				(0.002)	(0.006)	(0.007)
Constant	14.27***	14.28***	14.31***	14.50***	14.48***	14.49***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	87905	87105	86887	88633	87817	87598

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Our analysis in Table 10 reveals that individuals with higher perceived deflation risk still assign lower probabilities to stock market increases. The result overall holds over the whole sample and does not change substantially during the period of high perceived deflation risk starting in 2022, whereas the observed effect becomes generally weaker when controlling for demographics-, state-, and employment-status fixed effects.

Table 8: Deflation Expectations and Expected Change of Personal Earnings

This table reports panel regressions of individuals' expected change of personal earnings over the next 12 months on individuals' three-year deflation expectations. We also include an "After 2022" dummy, which is one for all observations in January 2022 or later, and interact it with the deflation expectation variables. Columns (1)–(3) are panel regressions in which the deflation expectation variable is the individuals' perceived deflation probability for a 3-year horizon, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are panel regressions in which the deflation expectation variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0) for a 3-year horizon. We include demographic, state, and employment-status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Earnings	(2) Earnings	(3) Earnings	(4) Earnings	(5) Earnings	(6) Earnings
After 2022	-15.36	-14.93	-13.22	-12.72	-12.36	-10.54
	(0.318)	(0.323)	(0.327)	(0.310)	(0.314)	(0.319)
Defl. Prob.	-24.51	-28.53	-30.19			
	(0.358)	(0.352)	(0.352)			
Defl. Prob. × After 2022	24.67	26.63	27.70			
	(0.355)	(0.352)	(0.353)			
Defl. Ind.				-11.40	-13.21	-14.55
				(0.359)	(0.354)	(0.352)
Defl. Ind. × After 2022				11.50	13.12	14.11
				(0.355)	(0.348)	(0.349)
Constant	19.60	20.06	20.12	16.95	16.99	16.93
	(0.203)	(0.212)	(0.213)	(0.176)	(0.184)	(0.183)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	100508	99519	99290	101335	100328	100098

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In summary, our results reveals that individuals' expectations related to a deflation scenario do not line up with the classical "deflation spiral" theory. Individuals who assign a high probability to a deflation state predict lower unemployment and unchanged earnings and income. At the same time, they tend to assign a lower probability to increasing stock prices compared to individuals who do not find a deflation scenario to be likely. As we will argue in Section 5, this set of beliefs is most consistent with the idea of a deflation

Table 9: Deflation Expectations and Expected Change of Household Income

This table reports panel regressions of individuals' expected change of total household income over the next 12 months on individuals' three-year deflation expectations. We also include an "After 2022" dummy, which is one for all observations in January 2022 or later, and interact it with the deflation expectation variables. Columns (1)–(3) are panel regressions in which the deflation expectation variable is the individuals' perceived deflation probability for a 3-year horizon, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are panel regressions in which the deflation expectation variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0) for a 3-year horizon. We include demographic, state, and employment-status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Income	(2) Income	(3) Income	(4) Income	(5) Income	(6) Income
After 2022	-11.06	-11.26	-9.822	-9.240	-9.411	-7.994
	(0.283)	(0.283)	(0.290)	(0.270)	(0.273)	(0.281)
Defl. Prob.	-15.52	-19.10	-19.69			
	(0.374)	(0.340)	(0.335)			
Defl. Prob. × After 2022	16.98	18.47	18.63			
	(0.331)	(0.307)	(0.310)			
Defl. Ind.				-7.564	-9.320	-10.05
				(0.366)	(0.329)	(0.322)
Defl. Ind. × After 2022				8.355	9.389	9.877
				(0.319)	(0.284)	(0.290)
Constant	16.18	16.74	16.68	14.46*	14.66*	14.58*
	(0.117)	(0.122)	(0.121)	(0.086)	(0.090)	(0.089)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	149142	147225	146896	151018	149059	148727

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

scenario being the reversal of a "profit-led inflation", being overall a positive state for the economy and employment but eroding firms' increased markups and thus leading to lower stock returns.

Table 10: Deflation Expectations and Perceived Probability of Increasing Stock Prices

This table reports panel regressions of individuals' perceived probability that the stock market will increase over the next 12 months on individuals' three-year deflation expectations. We also include an "After 2022" dummy, which is one for all observations in January 2022 or later, and interact it with the deflation expectation variables. Columns (1)–(3) are panel regressions in which the deflation expectation variable is the individuals' perceived deflation probability for a 3-year horizon, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are panel regressions in which the deflation expectation variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0) for a 3-year horizon. We include demographic, state, and employment-status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Stocks	(2) Stocks	(3) Stocks	(4) Stocks	(5) Stocks	(6) Stocks
After 2022	-4.023***	-4.072***	-3.960***	-4.093***	-4.225***	-4.106***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Defl. Prob.	-2.856***	0.00509	0.0675			
	(0.000)	(0.991)	(0.883)			
Defl. Prob. × After 2022	0.345	-0.946	-1.060			
	(0.718)	(0.324)	(0.271)			
Defl. Ind.				-2.742***	-0.941**	-0.894**
				(0.000)	(0.016)	(0.021)
Defl. Ind. × After 2022				1.382*	0.294	0.157
				(0.061)	(0.681)	(0.825)
Constant	43.38***	42.96***	42.95***	43.17***	43.02***	43.01***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	148455	146557	146229	150369	148419	148088

p-values in parentheses
What is the prob that the stock market is higher in 12months
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.2 Perceived Deflation Risk and Household Spending

We proceed to examine the link between perceived deflation risk and expected household spending. This link is particularly important as a critical ingredient of the "deflation spiral" theory. If deflation provides incentives to consume less and save more, individuals who assign high probabilities to a deflation scenario should expect to spend less in the future.

Table 11: Deflation Expectations and Expected Change of Household Spending

This table reports panel regressions of individuals' expected change of total household spending over the next 12 months on individuals' three-year deflation expectations. We also include an "After 2022" dummy, which is one for all observations in January 2022 or later, and interact it with the deflation expectation variables. Columns (1)–(3) are panel regressions in which the deflation expectation variable is the individuals' perceived deflation probability for a 3-year horizon, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are panel regressions in which the deflation expectation variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0) for a 3-year horizon. We include demographic, state, and employment-status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Spending	(2) Spending	(3) Spending	(4) Spending	(5) Spending	(6) Spending
After 2022	3.329***	3.460***	3.517***	3.399***	3.516***	3.599***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Prob. Defl.	-0.913**	-1.395**	-1.556*			
	(0.047)	(0.032)	(0.055)			
Prob. Defl. × After 2022	-0.116	0.0880	0.283			
	(0.878)	(0.914)	(0.767)			
Prob. Ind.				-0.836***	-1.119***	-1.254**
				(0.009)	(0.008)	(0.020)
Prob. Ind. × After 2022				-0.145	0.102	0.212
				(0.781)	(0.855)	(0.749)
Constant	4.753***	4.711***	4.723***	4.709***	4.624***	4.625***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	149208	147293	146964	151089	149133	148801

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In Table 11, we analyze this relation. We find that over the whole sample, higher perceived deflation risk is indeed significantly associated with lower expected spending in the future. A 10% higher probability assigned to a deflation translates to a reduction of spending by about 0.16% on average, and this result is not significantly altered in the period after 2022. A limitation to interpreting this result is that individuals likely think of household spending in dollar terms. Therefore, a scenario of falling consumption goods prices would mechanically reduce household spending, even the actual quantity of consumed goods and services were to remain unaffected.

4.3 Perceived Deflation Risk and House Prices

We finally examine whether perceived deflation risk is related to lower expected future house prices. This analysis is of great interest in two dimensions: First, it extends our results from Section 3.3, where we found that individuals' deflation expectations are connected with lower expected changes in gas and food prices, suggesting that their beliefs are internally consistent. Second, falling house prices are at the center of the theory of "debt deflation", under which deflation leads to mortgage defaults due to an increasing real value of debt.

In Tables 12 and 13, we report the results of panel regressions of individuals' expected home price increase over a 1-year and 3-year horizon, respectively, on the perceived deflation risk. We find that there is a strong and highly significant negative relation between perceived deflation risk and the expected home price changes over 1 and over 3 years. This effect is amplified and two to three times as large in the post-2022 period of high perceived deflation risk compared to the whole sample. In this period, a 10% higher perceived probability of deflation is accompanied by 0.45% lower expected house prices over a 1-year

Table 12: Deflation Expectations and Expected Home Price Change Over 1 Year

This table reports panel regressions of individuals' expected home price change over the next 12 months on individuals' three-year deflation expectations. We also include an "After 2022" dummy, which is one for all observations in January 2022 or later, and interact it with the deflation expectation variables. Columns (1)–(3) are panel regressions in which the deflation expectation variable is the individuals' perceived deflation probability for a 3-year horizon, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are panel regressions in which the deflation expectation variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0) for a 3-year horizon. We include demographic, state, and employment-status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Home 1Y	(2) Home 1Y	(3) Home 1Y	(4) Home 1Y	(5) Home 1Y	(6) Home 1Y
After 2022	0.195	0.231	0.241	0.435	0.482	0.491
	(0.821)	(0.789)	(0.781)	(0.596)	(0.559)	(0.554)
Defl. Prob.	-0.411	-1.520***	-1.610***			
	(0.255)	(0.000)	(0.000)			
Defl. Prob. × After 2022	-3.408***	-2.913***	-2.859***			
	(0.000)	(0.000)	(0.000)			
Defl. Ind.				-1.056***	-1.779***	-1.837***
				(0.000)	(0.000)	(0.000)
Defl. Ind. × After 2022				-3.106***	-2.602***	-2.545***
				(0.000)	(0.000)	(0.000)
Constant	5.633***	5.788***	5.806***	5.713***	5.771***	5.781***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	149191	147274	146945	151068	149106	148774

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

horizon and 0.77% lower expected home prices over a 3-year horizon. The result is consistent across all specifications and almost unaffected when controlling for demographics, state, and employment-status fixed effects. In summary, we find strong evidence that individuals who believe in a high probability of a deflation scenario associate such scenario with clearly lower house prices compared to the general population.

Table 13: Deflation Expectations and Expected Home Price Change Over 3 Years

This table reports panel regressions of individuals' expected home price change over the period between 24 and 36 months from the survey date on individuals' three-year deflation expectations. We also include an "After 2022" dummy, which is one for all observations in January 2022 or later, and interact it with the deflation expectation variables. Columns (1)–(3) are panel regressions in which the deflation expectation variable is the individuals' perceived deflation probability for a 3-year horizon, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are panel regressions in which the deflation expectation variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0) for a 3-year horizon. We include demographic, state, and employment-status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Home 3Y	(2) Home 3Y	(3) Home 3Y	(4) Home 3Y	(5) Home 3Y	(6) Home 3Y
After 2022	0.112	0.118	0.153	0.273	0.293	0.324
	(0.754)	(0.737)	(0.662)	(0.427)	(0.382)	(0.330)
Defl. Prob.	-1.041***	-2.109***	-2.202***			
	(0.000)	(0.000)	(0.000)			
Defl. Prob. × After 2022	-6.006***	-5.546***	-5.531***			
	(0.000)	(0.000)	(0.000)			
Defl. Ind.				-2.166***	-2.867***	-2.923***
				(0.000)	(0.000)	(0.000)
Defl. Ind. × After 2022				-4.664***	-4.224***	-4.200***
				(0.000)	(0.000)	(0.000)
Constant	5.559***	5.702***	5.718***	5.652***	5.707***	5.715***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	130468	128789	128499	131816	130111	129818

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5 Understanding Individuals' Deflation Beliefs

We put our results into perspective, with the goal of understanding what drives individuals' beliefs of the relation between a deflation scenario and other economic outcomes. First, we provide evidence that respondents reporting that they expect deflation properly understand its meaning and do not, for example, confuse "deflation" with "disinflation". Second, we

discuss to what extent individuals' beliefs on deflation and its relation to the state of the economy is in line with different economic theories, and finally consider the possibility that people's expectations do not fully account for deflation's general equilibrium effects.

Internal consistency of perceived deflation risk We ask whether individuals reported expectations on deflation should be taken and interpreted at face value. In particular, it may be possible that respondents reporting high deflation probabilities in fact confuse "deflation" (i.e., negative inflation) and "disinflation" (i.e., lower inflation compared to previous time periods). The rich amount of information of individuals' reported deflation expectations in the SCE allows us to address this concern, since it directly allows us to investigate whether respondents' reported inflation densities and point estimates are consistent with their answer to whether they expect inflation or deflation going forward.

Figure 7 shows, in the left plot, the percentage of individuals who reported that they expect deflation in the yes-no-indicator and at the same time reported a positive point estimate for future inflation; analogously, we also show the percentage of respondents indicating that they expect inflation but reporting a negative point estimate. While there is no single inconsistency on the inflation side, there are some individuals who report a positive point estimate while also claiming that they expect deflation; however, the percentage is extremely low with below 0.3% at any point in our sample, and no time trend is observable.

In the right plot, we show the percentage of inconsistent answers based on the reported probability distribution, and treat a response as inconsistent if the individual indicate that they believe in deflation but assign zero probabilities to all buckets with negative inflation, or indicate inflation but assign zero probabilities to all positive inflation buckets. Here, we find indeed that in the most recent period of high-deflation risk, the number of inconsistent

responses increases on the deflation side. However, quantitatively, less than 4% of the responses are internally inconsistent. When repeating our analysis from Sections 3 and 4 after removing "internally inconsistent" responses from our sample, we obtain very similar results. Overall, these findings indicate that individuals participating in the SCE do not generally misunderstand the meaning of deflation or confuse deflation and disinflation.

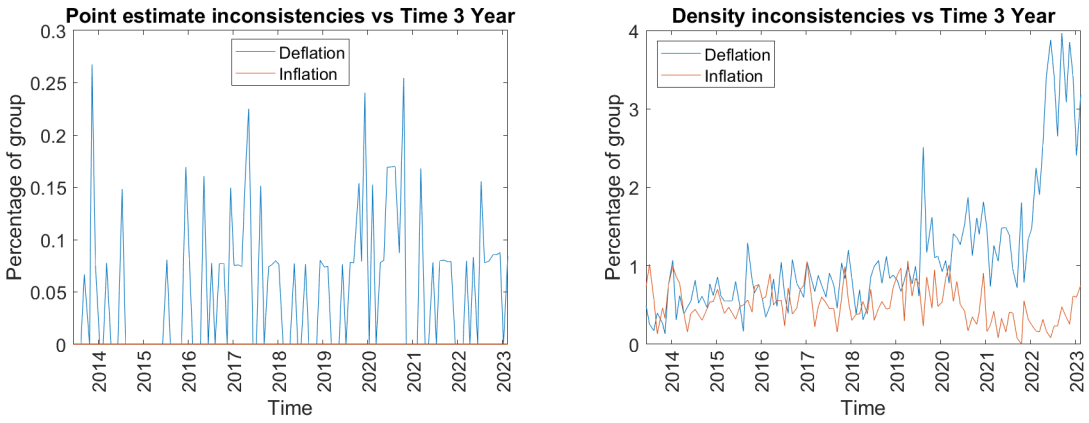


Figure 7: This figure shows the time series of the percentage of respondents who report inconsistent beliefs of deflation. A point estimate inconsistency is when a person reports that they expect deflation (inflation), but then later inputs a positive (negative) point estimate for expected rate of inflation. A density inconsistency is when a person reports that they expect deflation (inflation), but their density forecast of inflation is 100 percent (0 percent) inflation.

Bad vs. good deflation To put our results into perspective, we ask whether individuals who expect an upcoming deflation consider this as a generally negative or positive state for the economy. While economic theory strongly emphasizes mechanisms through which a deflation negatively affects the economy (e.g., deflation spirals and debt deflation), there are also incidences of "good deflation", that is, a deflation that is accompanied by strong economic growth and low unemployment (see Bordo et al., 2009; Borio et al., 2015). In theory, a "good deflation" can be caused by positive technology shocks, leading to an expansion of supply that outpaces the increase in aggregate demand, or by a price decline in imported

goods such as oil that has a positive effect on both the supply and demand side of the economy. Consistent with this notion, Rai and Sabourin (2023) find that respondents to the Canadian Survey of Consumer Expectations associate a deflation with a price reversal due to the possible resolution of underlying supply chain issues and related factors.

Our findings in Section 4 suggest that individuals do not associate a deflation scenario in the U.S. economy with an economic downturn. In particular, our results show that individuals assigning a high probability of future deflation anticipate lower general unemployment and greater personal job security. Furthermore, the perceived deflation risk is not associated with change in future earnings or income. These findings show that individuals tend to view deflation as a "good" state of the economy rather than a negative economic scenario.

Reversal of profit-led inflation It is interesting to relate our results to the recent debate on "profit-led" inflation (see, e.g., Weber and Wasner, 2023). According to this theory, the inflation that materialized in the recent years was driven mostly by corporate greed ("greedflation") and was accompanied by higher corporate profits through higher markups, translating also to higher realized stock returns. We discuss the possibility that individuals view a deflation scenario as the reversal of such supposed profit-led inflation, thus leading to lower stock returns but increased welfare for consumers and employers.

Our results in Section 4 show that individuals' beliefs may indeed be consistent with a reversal of profit-led inflation. This is reflected by lower stock returns expected by respondents who assign a high probability to a deflation scenario. At the same time, individuals do not expect a reduction in labor income or earnings, they expect higher employment and job security, and they expect lower household spending, consistent with the idea that an upcoming deflation would mostly reduce corporate profits and lead to less spending while

maintaining the same standard of living. Note that while Bilbiie and Kanzig (2023) formally argue based on that the recent high-inflation period is not consistent with the idea of profit-led inflation, our analysis is on the beliefs and expectations of survey respondents, which may be biased and inconsistent with economic theory.

Neglect of general equilibrium effects Along those lines, our findings indicate that individuals may think of deflation from the perspective of their own individual utility maximization — taking economic state variables as given — and neglect longer-term general equilibrium effects. In particular, individuals who believe in deflation anticipate lower household spending, which they interestingly do not associate with a negative effect on the economy; however, this would likely trigger the exact deflation spiral that leads to an economic recession and higher unemployment in the longer run. Similarly, we find that people believing in deflation strongly expect declining home prices, which would typically affect the economy negatively through the debt deflation channel. It is thus likely that individuals consider the scenario of deflation from a perspective of the first-order effects on their individual utility function, but potentially neglect equilibrium effects of their and other individuals' actions that materialize in the longer run.[5]

6 Conclusion

In this paper, we investigate the origins of individuals' deflation expectations and the economic outcomes that individuals associate with a future deflation scenario. Recent data from

[5] In analogy to the possible neglect of equilibrium effects by individuals, Greenwood and Hanson (2015) argue that firms partially neglect the increased investment of their competitors in response to high current earnings, leading to a future over-supply and low returns on investment.

the Survey of Consumer Expectations provide a unique laboratory for these issues for two reasons: First, the survey data include three different pieces of information on individuals' inflation expectations (deflation yes or no, inflation point estimate, and individual inflation probability distribution), alongside with numerous other pieces of information characterizing respondents' expectations of the overall economy. Second, individuals' perceived deflation risk rose to unprecedentedly high levels of more than 28% starting in 2022, despite a prevailing CPI inflation rate of greater than 8% at that time. The high perceived probability of deflation was not driven by a general increase in inflation uncertainty, but rather by the formation of a pronounced deflation tail in respondents' expectations. We use this unique setting to understand, first, what factors contribute to individuals viewing a future deflation likely, and second, what expectations about other economic variables individuals who assign a high probability to a deflation have.

Our results show that the recent increase in perceived deflation risk is not particularly driven by a specific demographic group, and not attributable to individual factors such as people's recent credit or finance situation. We find that individuals with high perceived deflation risk expect higher personal job security and lower unemployment in the economy, and they do not anticipate significantly lower individual earnings or household income compared to the general population. Therefore, individuals' views do not follow the classical theory that a deflation tends to coincide with a recession (either as a cause or as a consequence); instead, they rather correspond to the notion of a "good deflation". Our findings are particularly consistent with respondents viewing a future deflation as a reversal of past profit-lead inflation, that is, inflation caused by an increase in company's markups and profits. Accordingly, we find that individuals with high perceived deflation risk expect lower future stock prices. The survey respondents also associate a deflation scenario with declin-

ing home prices and lower individual household spending, suggesting that individuals may not fully incorporate the potential negative long-term equilibrium effects of deflation into their expectations.

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Appendix

A Survey Questions

Table A.1: This table provides an overview of the survey questions from the Survey of Consumer Expectations (SCE), conducted by the New York Fed, that we investigate in the empirical analysis of this paper. This first column refers to the variable name used in our tables, followed by the question identifier according to the New York Fed and the precise formulation of the question as presented to the survey participants. The last column lists the table(s) in our paper analyzing the responses to the respective question.

Variable	Question ID	Question	Table
Defl. Ind.	Q9bv2	Over the 12-month period between [Month, Year - 24 months from survey date] and [Month, Year - 36 months from survey date], do you think that there will be inflation or deflation?	All
Defl. Est.	Q9bv2part2	What do you expect the rate of [inflation (if Q9bv2=inflation) / deflation (if Q9bv2=deflation)] to be over that period? Please give your best guess.	–
Defl. Prob	Q9c	And in your view, what would you say is the percent chance that, over the [Month, Year - 24 months from survey date] and [Month, Year - 36 months from survey date] the rate of inflation (deflation) will be [inflation/deflation bins]	All
Recent finance	Q1	Do you think you (and any family living with you) are financially better or worse off these days than you were 12 months ago?	3
Gas	C4(1)	Twelve months from now, what do you think will have happened to the price of gas?	4
Food	C4(2)	Twelve months from now, what do you think will have happened to the price of food?	5
Unempl.	Q4new	What do you think is the percent chance that 12 months from now the unemployment rate in the U.S. will be higher than it is now?	6
Prob. Los.	Q13new	What do you think is the percent chance that you will lose your job during the next 12 months?	7
Earnings	Q23v2	Please think ahead to 12 months from now. Suppose that you are working in the exact same job at the same place you currently work, and working the exact same number of hours. What do you expect to have happened to your earnings on this job, before taxes and deductions?	8
Income	Q25v2	Over the next 12 months, what do you expect will happen to the total income of all members of your household (including you), from all sources before taxes and deductions?	9
Stocks	Q6new	What do you think is the percent chance that 12 months from now, on average, stock prices in the U.S. stock market will be higher than they are now?	10
Spending	Q26v2	Over the next 12 months, what do you expect will happen to the total spending of all members of your household (including you)?	11
Home 1Y	Q31v2part2	Over the next 12 months [...] By about what percent do you expect the average home price to [increase/decrease as in Q31v2]? Please give your best guess.	12
Home 3Y	C2part2	Over the 12-month period between [Month, Year - 24 months from survey date] and [Month, Year - 36 months from survey date] [...] By about what percent do you expect the average home price to [increase/decrease as in C2] over that period?	13
Recent Credit	Q28	Compared to 12 months ago, do you think it is generally harder or easier these days for people to obtain credit or loans (including credit and retail cards, auto loans, student loans, and mortgages)?	B.1
Near term Finance	Q2	And looking ahead, do you think you (and any family living with you) will be financially better or worse off 12 months from now than you are these days?	B.2
Near term Credit	Q29	And looking ahead, do you think that 12 months from now it will generally be harder or easier for people to obtain credit or loans (including credit and retail cards, auto loans, student loans, and mortgages) than it is these days?	B.3

B Additional Empirical Results

Table B.1: Recent Credit Situation and Deflation Expectations

This table reports panel regressions of individuals' three-year deflation expectations on dummy variables for their perceived difficulty to obtain credit relative to 12 months ago. The lowest value ("much worse") for the perceived recent credit situation is omitted. We also include an "After 2022" dummy which is one for all observations in January 2022 or later, and interact it with the credit situation dummies. Columns (1)–(3) are panel regressions in which the dependent variable is the individuals' perceived deflation probability, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are logistic panel regressions in which the dependent variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0). We include demographic, state, and employment status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Defl. Prob.	(2) Defl. Prob.	(3) Defl. Prob.	(4) Defl. Ind.	(5) Defl. Ind.	(6) Defl. Ind.
Worse	-0.0453***	-0.0231***	-0.0201***	-0.332***	-0.161***	-0.145***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.003)
Equal	-0.0589***	-0.0324***	-0.0285***	-0.561***	-0.348***	-0.327***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Better	-0.0544***	-0.0216***	-0.0172***	-0.448***	-0.179***	-0.154***
	(0.000)	(0.001)	(0.006)	(0.000)	(0.002)	(0.008)
Much Better	-0.0148	0.00874	0.0115	0.0955	0.291***	0.310***
	(0.144)	(0.365)	(0.233)	(0.277)	(0.001)	(0.001)
After 2022	0.0760***	0.0738***	0.0745***	0.747***	0.757***	0.769***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Worse × After 2022	0.0249	0.0320*	0.0320*	0.502***	0.576***	0.571***
	(0.157)	(0.058)	(0.058)	(0.000)	(0.000)	(0.000)
Equal × After 2022	0.0330	0.0296	0.0291	0.663***	0.647***	0.640***
	(0.121)	(0.136)	(0.135)	(0.000)	(0.000)	(0.000)
Better × After 2022	0.0406*	0.0334	0.0314	0.737***	0.669***	0.658***
	(0.099)	(0.134)	(0.160)	(0.000)	(0.000)	(0.000)
Much Better × After 2022	-0.0173	-0.0279	-0.0278	0.0846	-0.0495	-0.0562
	(0.672)	(0.489)	(0.487)	(0.717)	(0.842)	(0.822)
Constant	0.204***	0.179***	0.175***	-1.739***	-0.988***	-1.073***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	149286	147368	147039	151228	148917	148917

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.2: Near-Term Finance Situation and Deflation Expectations

This table reports panel regressions of individuals' three-year deflation expectations on dummy variables for their expected finance situation 12 months in the future. The lowest value ("much worse") for the expected future finance situation is omitted. We also include an "After 2022" dummy which is one for all observations in January 2022 or later, and interact it with the finance situation dummies. Columns (1)–(3) are panel regressions in which the dependent variable is the individuals' perceived deflation probability, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are logistic panel regressions in which the dependent variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0). We include demographic, state, and employment status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Def. Prob.	(2) Defl. Prob.	(3) Defl. Prob.	(4) Defl. Ind.	(5) Defl. Ind.	(6) Defl. Ind.
Worse	-0.0168	-0.00196	0.00174	-0.249**	-0.153	-0.129
	(0.100)	(0.850)	(0.865)	(0.011)	(0.135)	(0.211)
Equal	0.00454	0.0165	0.0212*	-0.168*	-0.103	-0.0674
	(0.679)	(0.144)	(0.057)	(0.089)	(0.319)	(0.515)
Better	0.0205*	0.0318***	0.0363***	0.0488	0.122	0.156
	(0.066)	(0.006)	(0.002)	(0.624)	(0.241)	(0.135)
Much Better	0.0550***	0.0569***	0.0598***	0.468***	0.470***	0.499***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
After 2022	0.0858***	0.0808***	0.0822***	1.076***	1.027***	1.049***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Worse × After 2022	0.0165	0.0173	0.0178	0.228	0.279*	0.270*
	(0.418)	(0.400)	(0.384)	(0.121)	(0.076)	(0.087)
Equal × After 2022	0.0269	0.0278	0.0258	0.338**	0.398**	0.378**
	(0.220)	(0.210)	(0.241)	(0.024)	(0.013)	(0.019)
Better × After 2022	0.0395*	0.0440*	0.0425*	0.315**	0.397**	0.377**
	(0.091)	(0.062)	(0.070)	(0.041)	(0.016)	(0.023)
Much Better × After 2022	-0.00457	-0.00110	-0.00428	-0.166	-0.122	-0.142
	(0.876)	(0.970)	(0.884)	(0.392)	(0.554)	(0.489)
Constant	0.144***	0.133***	0.129***	-2.096***	-1.255***	-1.339***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	149263	147342	147013	151213	148898	148898

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.3: Near-Term Credit Expectations and Deflation Expectations

This table reports panel regressions of individuals' three-year deflation expectations on dummy variables for their expected difficulty to obtain credit 12 months in the future. The lowest value ("much worse") for the expected future credit situation is omitted. We also include an "After 2022" dummy which is one for all observations in January 2022 or later, and interact it with the credit situation dummies. Columns (1)–(3) are panel regressions in which the dependent variable is the individuals' perceived deflation probability, aggregated from all bins that stand for a less-than-zero inflation. Columns (4)–(6) are logistic panel regressions in which the dependent variable is the individuals binary answer to the question whether they expect a future deflation (value 1) or inflation (value 0). We include demographic, state, and employment status fixed effects. Standard errors are double-clustered by household and survey date.

	(1) Defl. Prob.	(2) Defl. Prob.	(3) Defl. Prob.)	(4) Defl. Ind.	(5) Defl. Ind.	(6) Defl. Ind.
Worse	-0.0378***	-0.0124**	-0.00925*	-0.264***	-0.0624	-0.0466
	(0.000)	(0.028)	(0.098)	(0.000)	(0.233)	(0.372)
Equal	-0.0445***	-0.0160***	-0.0123**	-0.422***	-0.192***	-0.173***
	(0.000)	(0.007)	(0.034)	(0.000)	(0.001)	(0.002)
Better	-0.0437***	-0.00802	-0.00409	-0.319***	-0.0239	-0.00135
	(0.000)	(0.191)	(0.502)	(0.000)	(0.698)	(0.982)
Much Better	-0.00330	0.0200*	0.0230**	0.227**	0.427***	0.446***
	(0.761)	(0.062)	(0.032)	(0.020)	(0.000)	(0.000)
After 2022	0.0802***	0.0836***	0.0831***	0.824***	0.873***	0.884***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Worse × After 2022	0.0203	0.0204	0.0217	0.450***	0.473***	0.469***
	(0.217)	(0.221)	(0.195)	(0.000)	(0.000)	(0.000)
Equal × After 2022	0.0288	0.0204	0.0210	0.568***	0.520***	0.514***
	(0.138)	(0.311)	(0.291)	(0.000)	(0.000)	(0.000)
Better × After 2022	0.0371*	0.0234	0.0238	0.583***	0.469***	0.460***
	(0.068)	(0.243)	(0.229)	(0.000)	(0.001)	(0.001)
Much Better × After 2022	-0.0215	-0.0371	-0.0380	-0.0640	-0.235	-0.246
	(0.709)	(0.528)	(0.516)	(0.825)	(0.448)	(0.429)
Constant	0.193***	0.166***	0.163***	-1.837***	-1.119***	-1.203***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	149263	147344	147015	151203	148892	148892

p-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

C Additional Figures

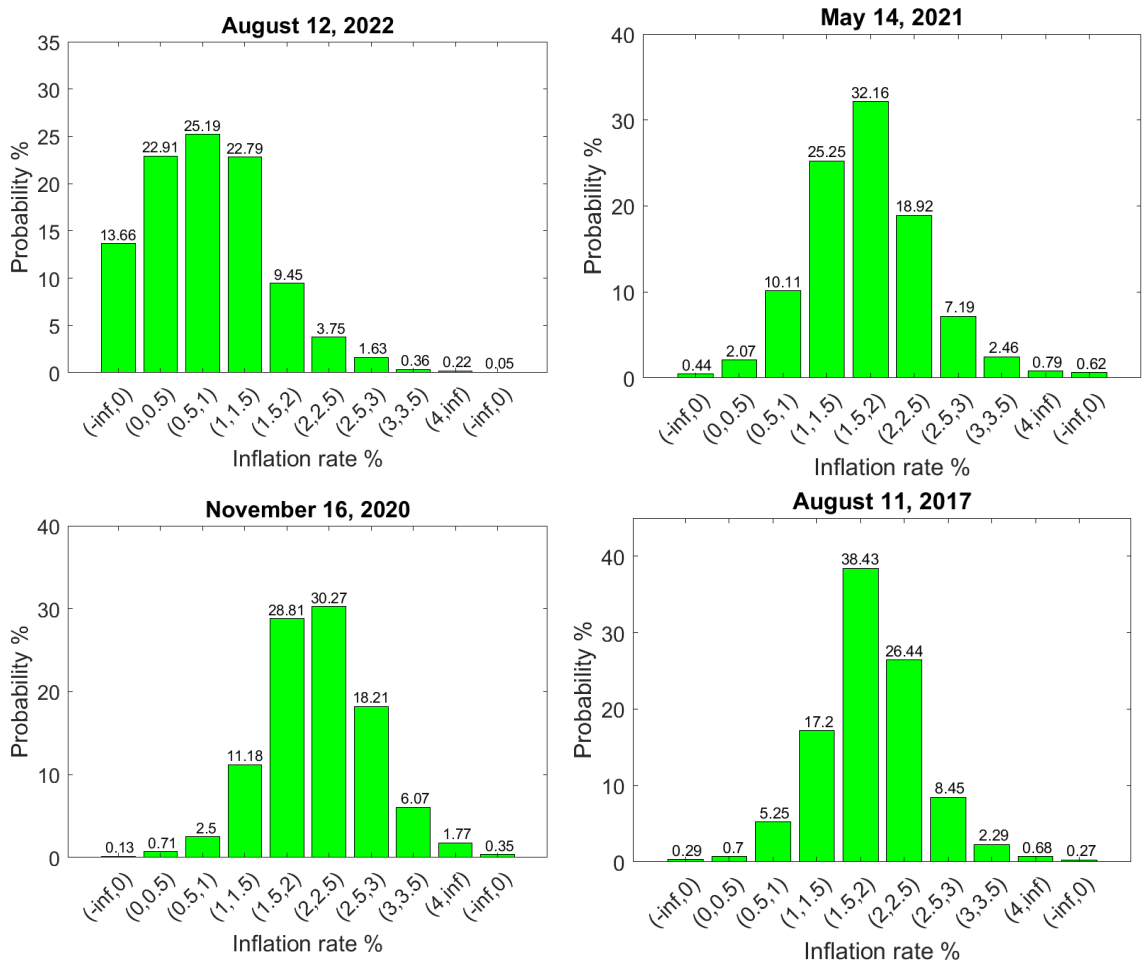


Figure C.1: This figure shows professional forecasters' perceived probability of different core CPI inflation outcomes 2 years ahead, as determined by the responses to the Survey of Professional Forecasters. Each survey respondent assigns probabilities of future inflation scenarios to the bins $(-\infty,0)$, (0,0.5), (0.5,1), (1,1.5), (1.5,2), (2,2.5), (2.5,3), (3,3.5), (3.5,4), and $(4,\infty)$ percent. We plot, for four selected dates, the inflation probabilities, averaged across all survey respondents within our sample. The bin $(-\infty, 0)$ stands for the average perceived probability of a deflation scenario.

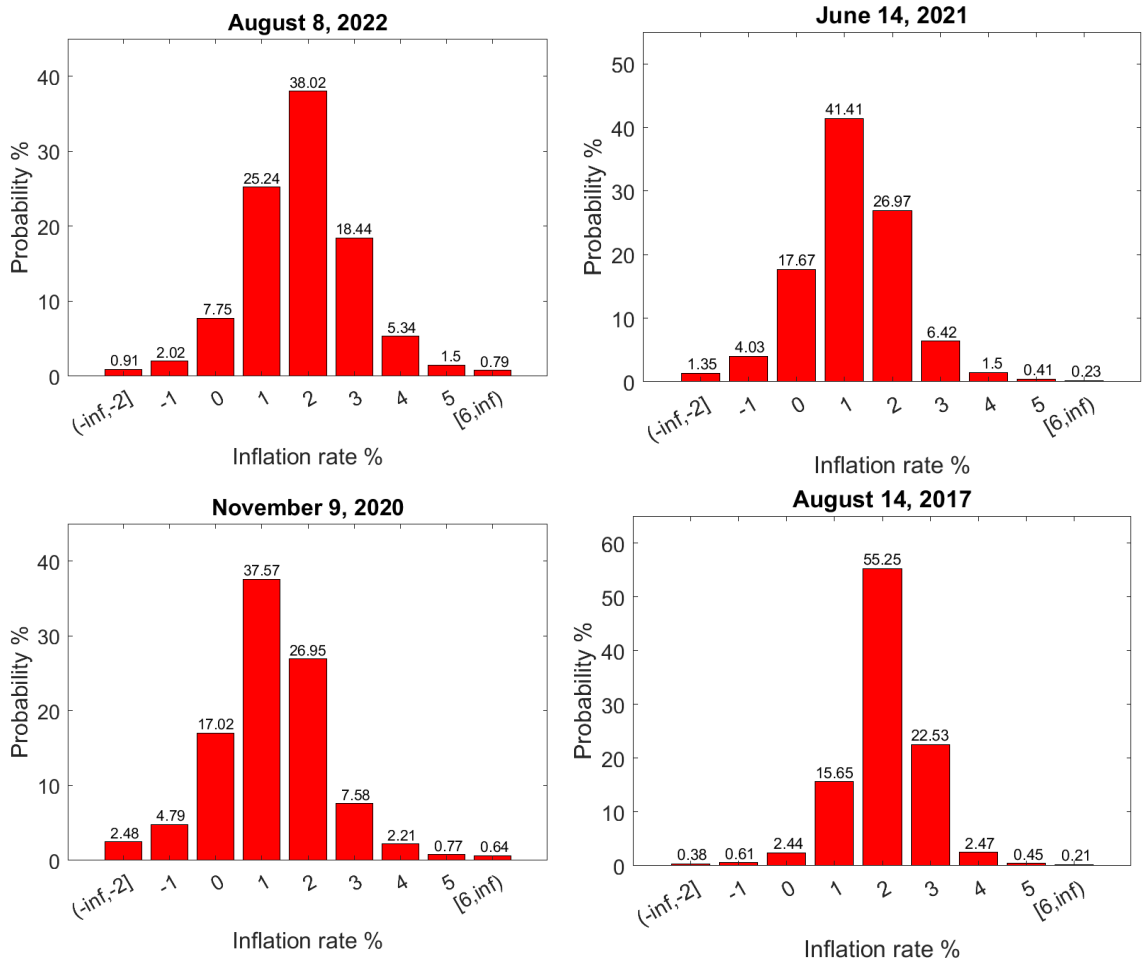


Figure C.2: This figure shows option-implied risk-neutral probabilities of different inflation outcomes 3 years ahead. The probabilities were computed based on zero-coupon inflation caps and floors using the butterfly method, which attributes the implied probabilities to full-integer inflation rates. We plot, for four selected dates, the option-implied inflation probabilities. The bars with values $(-\infty, -2)$ and -1 stand for the option-implied probability of different deflation scenarios.