# State-dependent inflation expectations and consumption choices

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BANK OF
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EUROSYSTEM

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November 27, 2023

### Abstract

This paper shows that the impact of inflation expectations on consumption depends on prevailing inflation. Beyond the quantitative-qualitative distinction in inflation expectations, differentiating among qualitative expectations of higher, constant, or positive inflation is key. Qualitative expectations have a greater impact on consumption than expected levels and changes in inflation, and the significance of specific qualitative expectations is contingent upon the prevailing inflation conditions. The effect of expecting qualitatively higher inflation on the willingness to consume is more pronounced during periods of inflation surges than in times of low and stable inflation, and is insignificant during periods of decline or deflation. Policy implications are discussed.

*Keywords:* inflation, expectations, consumption, savings, survey micro data.
*JEL-Codes:* D1, D8, E2, E3, E5.

# 1. INTRODUCTION

The current body of empirical evidence strongly supports the notion of inflation expectations significantly influencing households' consumption choices.[1] However, this evidence primarily comes from periods of low and stable inflation. Nevertheless, it is well-established that consumers perceive inflation differently depending on its level. In times of elevated and rising inflation, consumers tend to pay more attention to inflation, influencing their expectations about future inflation.[2]

This paper therefore investigates whether households' spending decisions are influenced differently by their inflation expectations during periods characterized by different inflation dynamics. To this end we utilize a novel, extensive dataset on inflation expectations sourced from the harmonized European Commission (EC) consumer survey for Slovakia, covering the period from January 2009 to August 2023. The inflation variation over this period, including the recent inflation surge and decline, differing from other papers, facilitates distinguishing between different phases of inflation. The dataset includes periods of surging inflation, declining inflation, deflationary periods, and normal times of stable inflation at around 2%. The survey provides individual information on

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[1] Among others, Andrade et al. (2023), D'Acunto et al. (2022), Crump et al. (2022), Burke and Ozdagli (2023), Dräger and Nghiem (2021), Vellekoop and Wiederholt (2019), Ichiue and Nishiguchi (2015) document a positive impact. Coibion et al. (2023) provide evidence for a negative impact.

[2] Consider, particularly, Cavallo et al. (2017), Weber et al. (2023), Pfäuti (2023a), Pfäuti (2023b), or Bracha and Tang (2022).

12-months ahead qualitative and quantitative inflation expectations,[3] as well as an individual assessment of the right time to purchase durable goods, commonly referred to as "readiness to spend" (Bachmann et al., 2015).[4]

Our findings reveal a negative relationship at the aggregate level between inflation and the propensity to consume. This is consistent with Coibion et al. (2023), who demonstrated that Dutch households reduce their durable consumption in response to elevated inflation expectations. However, at the individual level, controlling for a comprehensive set of individual characteristics and beliefs, including those about economic development and inflation levels, we find that inflation expectations do influence the propensity to consume in a positive but state-dependent manner. The strength of this relationship varies over time, with the underlying inflation regime serving as the state variable.

Understanding this state-dependence requires distinguishing between quantitative expectations and qualitative expectation regimes, as the latter have a greater impact on consumption choices than the expected levels and changes of inflation. It is also crucial to differentiate among individual qualitative regimes, as their relative importance fluctuates with inflation. The underlying inflation regime, such as whether inflation goes from low to higher levels or remains stable and low, determines which expected inflation regime will most impact consumption propensity.

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[3]Qualitative inflation expectations pertain to the directional outlook on whether people generally anticipate accelerating, constant, positive, unchanged, or falling inflation.

[4]We later demonstrate that survey evidence on the willingness to spend on durable goods is a strong predictor of actual consumption in Slovakia. Consequently, in this paper, we use the terms "consumption choices" and "propensity to consume" interchangeably.

Expectations of qualitatively higher inflation positively and significantly impact durable consumption during periods of low and stable inflation. The magnitude of this impact intensifies during periods of surging inflation. However, it becomes insignificant during periods of declining inflation and deflation. Nevertheless, during deflationary periods, when expecting higher inflation does not affect the propensity to consume, the anticipation of just a positive inflation, i.e. households expecting more generally prices to increase over the next year, has a significant effect on consumption. During declining inflation, neither qualitative nor quantitative inflation expectations significantly increase consumption choices. If anything, during periods of declining inflation we find that expecting qualitatively at least constant inflation decreases the propensity to consume durable goods. These observations highlight the time-varying impact of inflation expectations on consumption.

To document this state-dependence, we utilize a dataset which has been already successfully used to estimate the impact of inflation expectations on durable spending. Using this survey for Germany, France, UK and Sweden, D'Acunto et al. (2022) for the period 2000-2016 find for all four countries that consumers who expect increasing inflation over the following 12 months are more likely to answer that it is a good time to buy durables compared to individuals who expect constant or lower inflation. Andrade et al. (2023), using the French data but for the period 2004-2018, document a crucial role of the extensive margin, measured as the share of households expecting positive inflation in general, in explaining the fluctuations in average inflation expectations and in driving not

only the propensity but also the actual durable consumption.
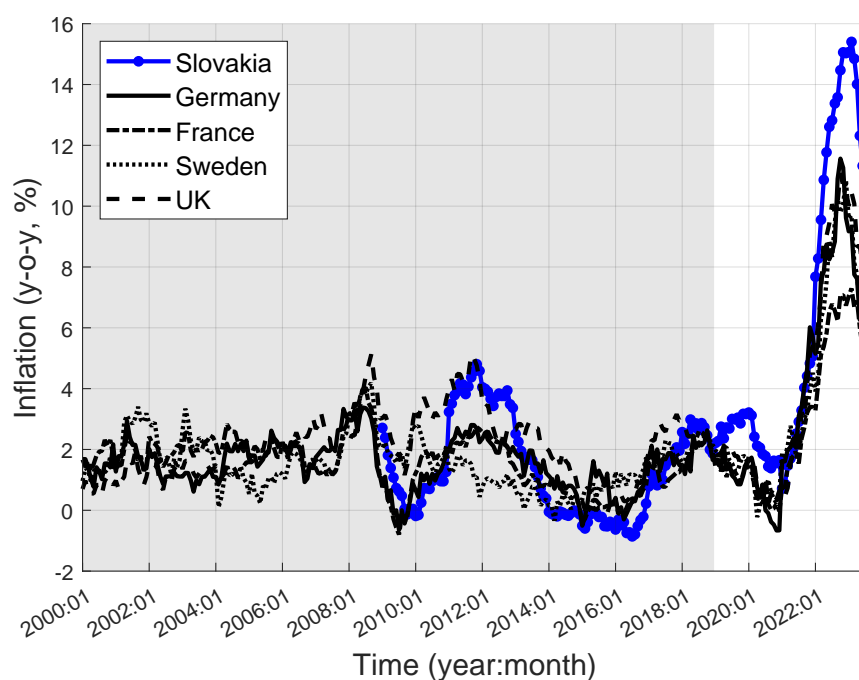


Figure 1: Periods covered by country studies

Notes: The gray shaded area highlights sample periods covered by other studies on inflation expectations using the EC harmonized consumer survey. In particular, the sample period of January 2000 until February 2016 corresponds to the study of D'Acunto et al. (2022) for Germany, France, Sweden and the UK and the sample period of January 2004 until December 2018 to Andrade et al. (2023) for France. The Slovak data used in this paper start in January 2009 and end in August 2023. All inflation rates are the monthly HICP y-o-y inflation rates in %.

The inflation dynamics in these countries are illustrated in Figure 1. The gray shaded area in the figure highlights the samples covered by the aforementioned studies focusing on times of stable and rather low inflation. The data for Slovakia used in this paper start in January 2009, when Slovakia joined the Eurozone, and end in August 2023. Over that fourteen-year period, the rate of increase in the official harmonized index of consumer prices (HICP) was in line with the experience in other European countries.[5] Compared to previous stud-

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[5]Table 6 in the appendix summarizes the moments of the inflation times series for the different countries. It is worth noting that Slovakia experienced a minor but persistent deflationary

ies, we look specifically at different sample periods including the recent inflation surge and consider systematically various indicators of inflation expectations.

Using the micro data from the EC Consumer Survey for Slovakia we first observe that the main stylized facts from the literature on developed economies and low inflationary times (D'Acunto et al., 2022; Weber et al., 2022; D'Acunto et al., 2022) do hold also under Slovak conditions. In particular, we observe that subjective inflation expectations are upward biased, dispersed and volatile, second that they differ systematically across demographic groups, and third that, in fact, the expectations have a significant effect on households' consumption choices.

Our main finding of the state-dependent impact of inflation expectations on consumption choices is accompanied by two other novel observations. First, we show that the extensive margin plays a much smaller role in explaining the variance of aggregate inflation expectations when inflation is not low and stable. Andrade et al. (2023) show that the extensive margin drives the fluctuations in aggregate inflation expectations in France during the period 2014-2018. In this time window the headline inflation was 1.5% on average. However, during inflationary times when the share of people expecting positive inflation is

period over the years 2014-2016 and that the inflation peak during the recent inflationary period was among the highest in Europe. Given these considerable fluctuations and especially the sample span reaching up to August 2023, this dataset allows us to document inflation expectations dynamics at various levels of inflation while still focusing on an economy comparable to countries for which some evidence on inflation expectations already exists. Slovakia is a member of OECD since 2000, a member of the European Union since 2004 and an Eurozone member since 2009.

large and close to one, it is the intensive margin which matters for explaining the fluctuations in the average expected inflation. Hence, outside the stable inflation range (1-3%), individually expected inflation levels drive the variance of aggregate inflation expectations (intensive margin). However, we find that even during such periods it is still the extensive margin and its subsets which influence the willingness to consume more than the intensive margin. This provides supportive evidence for the findings in Andrade et al. (2023), extend them to times of varying inflation and generalize them by showing that the importance of the subsets of extensive margin changes over time.

The second novel finding is that individuals responding with "I do not know" to questions about future inflation, conditional on answering questions about perceived inflation, tend to decrease their consumption propensity, indicating increased uncertainty. Furthermore, this effect varies over time, becoming more pronounced during transitions from low to high inflation. The reaction of uncertain consumers therefore contrasts with that of consumers expecting higher inflation, who boost their propensity to consume when inflation surges. Altogether, our results are consistent with regime- and agent-specific Euler equations.

**Literature**  Our findings contribute to several strands of the literature. First and most importantly, in the literature on the impact of inflation expectations on consumption choices,[6] our study contributes by highlighting the substantial

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[6]See inter alia works by Andrade et al. (2023), D'Acunto et al. (2022), Crump et al. (2022), Burke and Ozdagli (2023), Dräger and Nghiem (2021), Vellekoop and Wiederholt (2019), Bachmann et al. (2015), Ichiue and Nishiguchi (2015), and Coibion et al. (2023).

time-variation in the results. This variation is driven by the changing nature of inflation dynamics, which affects the predominant ways in which inflation expectations are formed. We achieve this through the use of a unique dataset from Slovakia, characterized by its varying inflation fluctuations, allowing us to differentiate between distinct inflationary periods.

In addition, we provide a systematic comparison of various measures of inflation expectations. While D'Acunto et al. (2022) use expecting qualitatively higher inflation in the next 12 months than during the past 12 months as an indicator of inflation expectations, Andrade et al. (2023) focus on the difference between a decision to expect positive inflation relative to the quantitative level of expected inflation. Notably, the extensive margin of Andrade et al. (2023) encompasses the measure used by D'Acunto et al. (2022). Most prior studies rely solely on quantitative expectations. In this paper, we provide a systemic evaluation of these measures.

Furthermore, we extend the scope by investigating the impact of inflation uncertainty on consumption choices. In doing so, we expand upon the direct measure of attention to inflation proposed by Bracha and Tang (2022), specifically the proportion of people responding to questions about past, perceived inflation. We examine consumers who, even when attentive, do not answer questions about future inflation. This approach provides insights into individual uncertainty, revealing a time-varying decrease in the willingness to consume, particularly during periods of surging inflation.[7]

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[7]Binder (2017) introduces a method for quantifying uncertainty in survey responses about

**Implications**    A primary goal of our empirical investigation into the role of inflation expectations in consumer decisions is to provide insights for monetary policy and macroeconomic modeling. The outcomes gained from analyzing micro-level data on inflation expectations in Slovakia lead to at least three key observations.

First, considering the substantial impact of qualitative expectation regimes, qualitative communication about inflation could exert a more pronounced influence on consumption choices.

Second, despite the fact that inflation expectations enhance the inclination to spend, it is crucial to recognize the negative aggregate, unconditional relationship between the willingness to spend and inflation. This poses a challenge for managing inflation expectations, particularly in times of soaring inflation when anticipating higher inflation increases aggregate demand. While monetary policy might aim to counteract this by adopting a more contractionary stance, the overall level of aggregate demand remains subdued. Consequently, identifying the primary drivers of aggregate demand beyond inflation expectations is necessary and warrants further research.

Third, our findings suggest that discussions on the de-anchoring of inflation expectations could benefit from considering the patterns in qualitative inflation regimes. These patterns provide valuable insights into consumers' willingness

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inflation expectations, based on rounded figures. Her preferred method for aggregating inflation uncertainty also accounts for individuals who respond with 'don't know' (DK). However, in her microeconometric analysis, she excludes respondents who give a DK answer. Our approach diverges by focusing on respondents who are uncertain yet attentive to inflation, without factoring in the rounding of numbers.

to spend and might suffer less from overestimating quantitative levels of inflation.

The remainder of the paper is organized as follows. Section 2 describes in detail the data used in this paper. Section 3 documents facts about fluctuations of inflation expectations in Slovakia. Section 4 is the key section in which we present the empirical evidence on the impact of inflation expectations on consumption choices. In Section 5 we consider the predictive power of the various indicators of inflation expectations for actual inflation. Section 6 concludes with a discussion on economic models and extends into considerations for monetary policy.

# 2. DATA

## 2.1. SAMPLE AND SURVEY

Our main data source, both on individual inflation expectations and consumption propensities, are the confidential micro data from the harmonized EC consumer survey program for Slovakia.[8] Data from this survey but for other countries have been already successfully used in other research works. In particular, D'Acunto et al. (2022) use the data for Germany, France, UK and Sweden, D'Acunto et al. (2022) for Finland or recently Andrade et al. (2023) for France and Germany.

In Slovakia, the survey is conducted on a monthly basis as a non-repeated cross-

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[8]This survey is conducted by the Statistical office of the Slovak republic on behalf of the Directorate General for Economic and Financial Affairs of the European Commission as part of the European Commission's harmonized consumer survey program.

section of 1,200 consumers.[9] The survey is run as a personal interview during the first ten days of each month. The respondents are asked questions which range from assessing their own financial situation, inflation perceptions and expectations, the willingness to spend and consume up to their perceptions and expectations concerning the economic development of the whole economy. All twelve monthly survey questions are listed in the appendix in Section D.2.

It is important to note that individual survey replies are confidential. Only aggregated results for different socio-demographic groups at the country level are publicly available, with the exception of the balances for elicited quantitative inflation perceptions and expectations, which are also confidential.

The data used in this paper have been provided by the Statistical office of the Slovak republic for the period January 2009 until August 2023 including the quantitative answers on inflation perceptions and expectations.

Following Andrade et al. (2023) and D'Acunto et al. (2022), the main survey questions of interest capturing the willingness to purchase durables goods and qualitative and quantitative inflation expectations are as follows:[10]

**Question 5**     "How do you think consumer prices have developed over the last 12 months? They have [Risen a lot, Risen moderately, Risen slightly, Stayed about the same, Fallen, Don't Know]."

If the answer is not "Stayed about the same" or "Don't know," the respondent

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[9]The dataset in France, as used by Andrade et al. (2023), feature a short panel dimension for households responding to several interviews. This is not the case in Slovakia.

[10]Andrade et al. (2023) who use the French data also consider the question on realized durable consumption of the past 12 months. The question "Have you made any major purchases over the last 12 months? [Yes; No; Don't know]" is, however and interestingly, not part of the Slovak survey. Therefore we focus on questions which are common for all surveys.

will be asked for a point estimate (Question 5A).

**Question 5A** "By what percentage do you think consumer prices have changed over the last 12 months? [... percent]"

In a similar vein the inflation expectations get elicited in Question 6 and 6A.

**Question 6** "Which development of consumer prices do you expect over the next 12 months? They will [Increase more rapidly, Increase at the same rate, Increase at a slower rate, Stay about the same, Fall, Don't Know]."

If the answer it not "Stay about the same" or "Don't know," the respondent will be asked for a point estimate (Question 6A).

**Question 6A** "By what percentage do you think consumer prices will change over the next 12 months? [... percent]"

The qualitative measure of spending attitudes is gathered from the responses to the question about whether it is a good or bad time to buy a variety of durable goods:

**Question 8** "In view of the general economic situation in Slovakia, do you think that now it is or it is not the right moment for major purchases (furniture, household appliances, electronics, etc.) ? [It's neither a good nor a bad time; No, it's a bad time; Yes, it's a good time.]"

In addition, we use questions regarding expectations and perceptions about own financial situation, economic growth in Slovakia, unemployment, and considering given time as the right time to save as well as a rich set of socio-demographics which include gender, age, income per household member, education, employment and financial status.

## 2.2. DURABLE CONSUMPTION DECISIONS

Is the survey data on the propensity for durable consumption (Question 8) a reliable indicator of actual consumption in Slovakia? This inquiry is crucial, particularly for durable goods, as discrepancies between survey results and actual consumption patterns could undermine the usefulness of this data in predicting the Euler-equation mechanism. To assess the validity of the survey measure, we adopt the approach of Andrade et al. (2023), who investigated its correlation with annual consumption growth.

The share of people in the overall sample replying that at the given time it was right to purchase durable goods is approximately 19%. This number raises to more than 21% during the deflationary period 2014-2016 and declines to almost 14% during the inflation surge (June 2021 - December 2022) and 11.7% in 2023 (see Table 1 and Table 7).

These patterns are in line with the consumption growth in Slovakia. In particular, the fraction of individuals reporting that it is the right time to purchase durable goods is strongly positively correlated with the growth rate of real consumption. The correlation coefficient is relatively large at 0.72 for the sample period 2010-2019 and 0.37 for the whole sample 2010-2023. Andrade et al. (2023) report a correlation of approximately 0.4 for France for the sample period 2004-2018.

Moreover, the correlation with durable consumption is also positive despite being slightly smaller, 0.58 for 2010-2019 and 0.22 for 2010-2023. This shows that,

although the question is about major consumption expenditures, it is strongly linked to the actual consumption decisions and even more than to durable consumption per se. Figure 10 in the appendix plots the co-movement of the series over time.

## 2.3. DESCRIPTIVE STATISTICS

To assess if the effect of inflation expectations on consumer decisions changes over time, we have segmented our sample into distinct sub-periods, each characterized by different prevailing inflation dynamics: a period of inflation surge from June 2021 to February 2023, deflationary times from January 2014 to December 2016, and the period from March 2023 to August 2023, marked by a decrease in inflation, as illustrated in Figure 2. Notably, the average inflation expectation began to fall in January 2023, preceding the peak of actual inflation in February 2023. All other periods are categorized as normal times, characterized by low and stable inflation.

Table 1 provides an overview of the main variables of interest and variables characterising the various sample periods. More detailed statistics can be found in Table 7 in the appendix.

**Indicators of inflation expectations** We consider the various inflation expectations measures used by D'Acunto et al. (2022) and Andrade et al. (2023). In particular, stressing the benefits of qualitative measures D'Acunto et al. (2022) use as an indicator of inflation expectations a dummy variable ($\pi^e_{DHW}$) that equals one if a household expects inflation to increase (see possible replies to

| | whole sample | surge | defl. times | drop | remains |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| time sample | 2009:01-2023:08 | 2021:06-2023:02 | 2014:01-2016:12 | 2023:03-2023:08 | all other periods |
| no. obs. | 119,387 | 11,322 | 23,877 | 3,185 | 81,003 |
| *Measures of inflation expectations and readiness to spend (sample shares)* | | | | | |
| readiness to buy durables (Q8) | 18.8% | 14.5% | 21.0% | 11.9% | 19.0% |
| inflation increasing more rapidly (Q6) | 27.5% | 52.0% | 13.9% | 27.4% | 28.5% |
| inflation at least constant (Q6) | 65.8% | 85.6% | 47.7% | 62.1% | 68.9% |
| inflation will be positive (Q6, Q61) | 81.2% | 95.0% | 65.2% | 91.9% | 83.6% |
| average $\pi^e$ conditionally on $\pi_{i,t}^e > 0$ (Q61) | 11.2% | 19.0% | 6.9% | 28.4% | 10.1% |
| *Macro variables (time-series averages)* | | | | | |
| average headline HICP $\pi_t$, y-o-y | 2.9% | 9.1% | -0.3% | 12.9% | 2.1% |
| average quant. $\pi^e$, 12-months ahead (Q61) | 9.4% | 18.7% | 4.0% | 25.8% | 8.4% |
| readiness to buy durables (Q8) | 17.3% | 12.8% | 21.0% | 11.1% | 17.6% |
| average households' nom. $i_t$ | 4.8% | 2.4% | 5.1% | 5.0% | 5.1% |

Table 1: Descriptive statistics

Notes: This table reports key statistics for this study in the whole sample and the sub-periods which differ in the prevailing inflation regime. Time periods are as follows: (2) surge June 2021 - February 2023, (3) deflationary times January 2014 - December 2016, (3) drop March 2023 - August 2023, (4) remains are periods other than (2), (3) and (3). The upper block *(sample shares)* shows the means in the pool of answers in the given period. The lower block *(time-series averages)* provides the averages of cross-sectional averages over time. The share of answers indicating positive inflation expectations, $\pi_{i,t}^e > 0$, is the measure of the extensive margin and since we discard zero observations associated with other Q6 answers than "stay the same," the share of qualitative answers (Q6) and quantitative answers (Q61) is identical. Average households' nom. $i_t$ refers to the households' average lending rate.

Question 6 in Section 2.1).

On the other hand, stressing the importance of the binary decision to expect positive inflation or not in the first place, Andrade et al. (2023) focus on two measures of inflation expectations: First, the share of people expecting positive inflation which they refer to as the extensive margin and in turn the intensive margin, which is the average inflation expectation conditional on expecting positive inflation.

The share of people anticipating rising inflation, i.e. the preferred measure of D'Acunto et al. (2022), is a subset of the overall extensive margin. For the sake of completeness, in Table 1 we also report the share of people indicating qualita-

tively that inflation will stay at least constant, i.e. the sum of shares with rising and constant inflation expectations.

**Micro data preparation for regression analysis**  In total, there are 191,081 raw observations in the full sample from January 2009 to August 2023. Our data cleaning strategy consists of two steps. First, following the validity checks of the Slovak Statistical Office, we exclude all observations where the respondent provided a zero quantitative reply to question Q6A despite indicating in the qualitative question that inflation would not be zero. Additionally, to facilitate meaningful control for the impact of control variables in the regression of propensity to consume on inflation expectations, we eliminate all observations that lack responses to at least one of the questions Q1, Q2, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q12, as well as those missing individual income or, finally, quantitative perceptions and expectations.

The various steps involved in sample selection reduce the number of observations from 191,081 to 119,387, retaining 62.5% of the raw observations. Despite losing a significant portion of observations, both the full and selected samples are still remarkably comparable in terms of demographic dimensions (Table 8). In the nationally representative full sample, there is a slightly higher proportion of older people (aged 65+), individuals with lower education levels, and those not active in the labor market. However, overall, the selected sample closely approximates the full sample and does not exhibit marked differences along any significant demographic dimension.

# 3. FLUCTUATIONS IN INFLATION EX-PECTATIONS

This paper's primary contribution lies in demonstrating that the influence of inflation expectations on consumption choices not only varies over time but also depends on the prevailing inflation dynamics. Prior to delving into this analysis, it is in order to outline the key characteristics of the Slovak inflation expectations data and briefly contrast them with existing literature. Three observations emerge: (1) there is a positive correlation between the upward bias in expectations and actual inflation; (2) inflation expectations tend to mirror inflation perceptions; and (3) fluctuations in aggregate inflation expectations are predominantly driven by the extensive margin rather than the intensive margin.

## 3.1. POSITIVE CORRELATION OF THE UPWARD BIAS WITH INFLATION

We begin by analyzing the aggregate moments of inflation expectations over time, as illustrated in Figure 2. A notable discrepancy exists between the average expected level of inflation and the actual inflation rate, a phenomenon often referred to as the upward bias in inflation expectations.[11] From January 2009 to August 2023, Slovakia's average inflation (black dashed line) was 2.9%, while the average expected inflation (blue solid line) was significantly higher at 9.4%,

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[11]For comprehensive discussions about possible explanations see, among others, Weber et al. (2022) and Reiche and Meyler (2022).

indicating an upward bias of approximately 6.5 percentage points. Notably, this bias increased from 5.8 percentage points before June 2021 to 9.6 percentage points during the inflation surge period. Conversely, it decreased to less than 4 percentage points during the deflationary period.

The positive correlation of the upward bias with actual inflation is puzzling, since if people are more attentive to inflation, one would expect a negative correlation of the upward bias with inflation. A possible explanation is that people are more attentive to a certain class of products.[12] As detailed in Section D.6 in the appendix, LASSO regressions indicate that during the recent inflationary period, the rise in the upward bias was primarily due to food inflation, which accounted for about 90% of the variation in inflation expectations, compared to 50% before June 2021. Given that food inflation exceeded headline inflation and people tend to focus on frequently purchased items for their inflation expectations, as outlined by D'Acunto et al. (2021), this factor likely contributes to the observed positive correlation with inflation.[13]

Second, the moments of the distribution closely reflect fluctuations in inflation. Therefore, despite the presence of an upward bias, consumers typically adjust their expectations in response to changes in inflation. We will revisit this topic, particularly focusing on how inflation perceptions influence the formation of inflation expectations, in Section 3.3.

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[12]I want to thank an anonymous referee within the National Bank of Slovakia review process for highlighting this observation.

[13]In Section D.8 in the appendix we report mean, median, and standard deviation of inflation expectations and perceptions for different socio-demographic groups. Also in Slovakia, inflation expectations differ systematically across socio-demographic groups in line with the empirical evidence (D'Acunto et al., 2022; Weber et al., 2022).
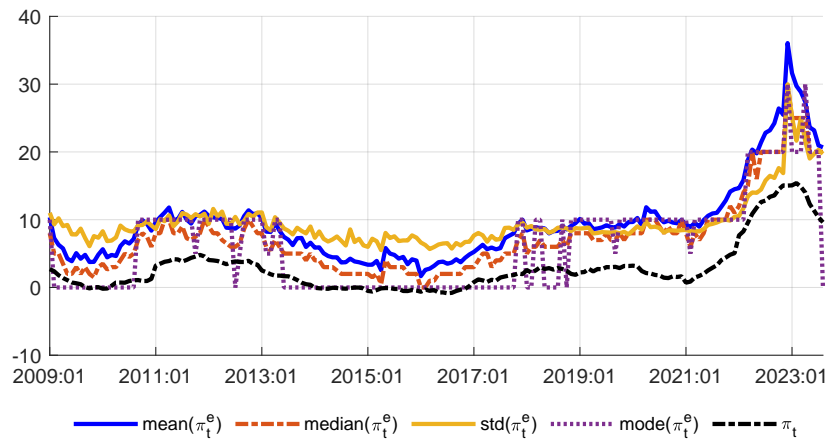
Figure 2: Time series inflation expectations moments

Notes: This figure shows the monthly HICP, y-o-y, inflation rate in % against the average expected inflation in the cross-section of the given month, as well as the median, the standard deviation and the mode.

Third, the distribution of inflation expectations in Slovakia is consistently right-skewed, with the mean monthly expected inflation being approximately 2 percentage points higher than the median. D'Acunto et al. (2022) find that in the United States the mean of consumers' inflation expectations exceeds the median by 1 percentage point. In Slovakia, this discrepancy was 1.9 percentage points prior to the inflation surge (from January 2009 to May 2021) and 2.1 percentage points when including the surge period. This indicates only a marginal increase in skewness over time (see Section 3.2)

D'Acunto et al. (2022) and Weber et al. (2022) observe that in the US during the COVID pandemic, the 25th and 75th percentiles of inflation expectations moved in opposite directions, signalling a divergence in consumer expectations about price level growth. However, this trend was not mirrored in Slovakia. There, neither the interquartile range, skewness, nor kurtosis exhibited significant changes preceding the increase in the mean or median of inflation

expectations, as illustrated in Figure 14 in the appendix.

## 3.2. DISTRIBUTION OF EXPECTATIONS OVER TIME

Figure 3 depicts the evolution of the quantitative distribution of inflation expectations since early 2019. Recently, there has been a notable shift towards higher levels of expected inflation, particularly during the recent surge, which may indicate that these expectations are becoming de-anchored. Our ability to delve deeper into the issue of de-anchoring is limited, as we lack data on inflation expectations beyond a one-year horizon. Nevertheless, as demonstrated by Weber et al. (2022), when households adjust their short-term inflation expectations, they typically make similar revisions to their longer-term expectations. This pattern is also observed among firms and professional forecasters.
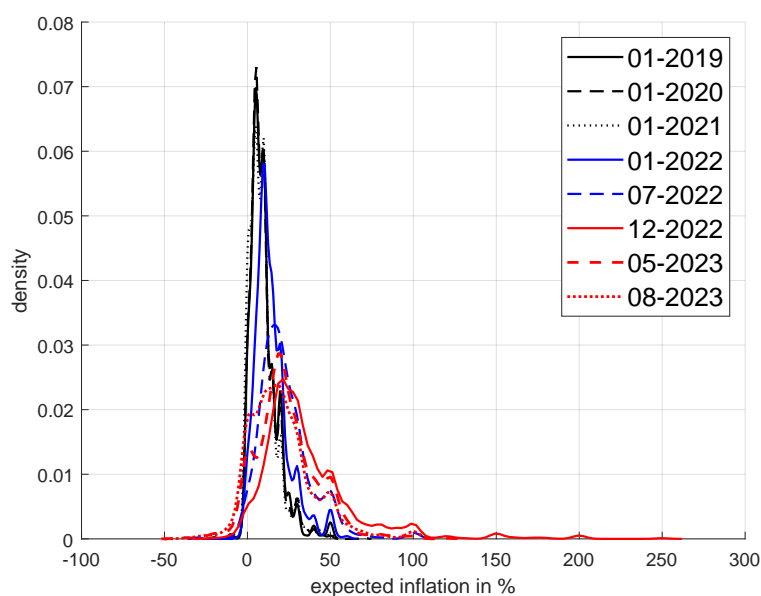


Figure 3: Distribution of inflation expectations over time

Notes: This figure illustrates the shifts of the distribution of quantitative inflation expectations over time, from January 2019 until August 2023. All quantitative replies are included.

## 3.3. PERCEIVED AND EXPECTED INFLATION

In the previous chapter, we explored the dynamics of inflation expectations over time. This section illuminates the formation of these expectations in Slovakia, particularly noting the strong correlation between perceived and subsequent expected levels of inflation. Identifying the effect of perceptions on expectations goes back at least to Jonung (1981) and is thoroughly discussed in Weber et al. (2022).

Figure 4 illustrates the relationship between actual inflation and Slovak households' perceptions and expectations of inflation. Despite the notable upward bias in consumers' expectations, their choice of expected inflation rate for the next 12 months is predominantly influenced by their current perception of inflation. Remarkably, even during 2022, when Slovakia's inflation rate surged, perceptions and expectations remained closely aligned. However, a divergence has emerged in 2023. As we discussed earlier, food prices have recently played a significant role in driving inflation expectations. A plausible explanation for the recent decoupling is the stabilization of commodity markets, leading households to not anticipate further significant increases. Consequently, while their inflation expectations have decreased substantially, they continue to confront high perceived inflation levels.

Does this strong relationship between inflation perceptions and expectations exist solely in Slovakia? The lack of access to quantitative data on inflation expectations and perceptions from other countries prompts us to explore this
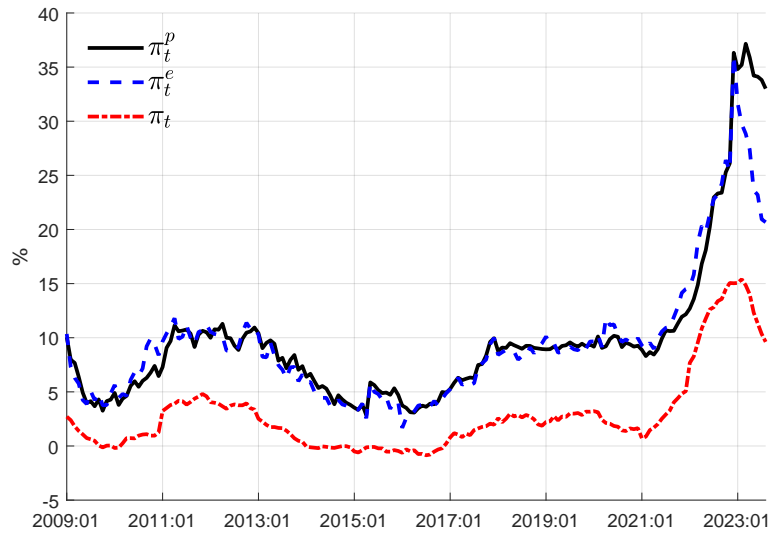
Figure 4: Co-movement of inflation perceptions and expectations with inflation

question using aggregated qualitative data from the EC consumer survey across
various countries. As elaborated in Section D.10, while Slovakia shows a high
correlation between qualitative expectations and perceptions, akin to its quanti-
tative counterparts, the pattern across countries is far from uniform. In fact, sev-
eral countries exhibit only a modest degree of contemporaneous co-movement
between these two measures.

## 3.4. EXTENSIVE VERSUS INTENSIVE MARGIN

What is driving inflation expectations, the share of people expecting non-zero
inflation (extensive margin) or the level of expectations conditional on expect-
ing non-zero inflation (intensive margin)? To this end we follow Andrade et al.
(2023) who apply the decomposition proposed for price changes by Klenow and

Kryvtsov (2008) to inflation expectations. Using data from the EC consumer survey for France (2004-2018) the authors show evidence for the extensive margin accounting for 75% of the total variance of the average inflation expectation over time.[14]

Let's denote the share of people expecting non-zero inflation by $fr_t^e$ and the average size of inflation expectation conditional on expecting non-zero inflation by $dp_t^e$. This implies that the average expected inflation is defined as the product of these two variables

$$\pi_t^e = fr_t^e \cdot dp_t^e. \tag{1}$$

Considering a first-order approximation around the sample mean, the extensive and intensive margins in inflation expectations are given by:

$$em_t^e = (fr_t^e - \bar{fr}_t^e) \cdot \bar{dp}_t^e, \tag{2}$$

$$im_t^e = (dp_t^e - \bar{dp}_t^e) \cdot \bar{fr}_t^e. \tag{3}$$

It follows that the average de-meaned expected inflation is given by the sum of those, i.e.

$$\pi_t^e - \bar{\pi}^e = em_t^e + im_t^e + \mathcal{O}_t. \tag{4}$$

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[14]Andrade et al. (2023) omit households that expect a decrease in prices from their baseline analysis, thereby defining the extensive margin as the proportion of people anticipating positive inflation, rather than non-zero inflation. In our decomposition of inflation expectations in this section, we include negative inflation expectations within the extensive margin, as our analysis encompasses periods of deflation. However, as further outlined in Section D.11, the proportion of people expecting non-zero inflation is almost entirely influenced by those expecting positive inflation. Consequently, for Slovakia, our results remain consistent regardless of whether negative expectations are included or excluded.
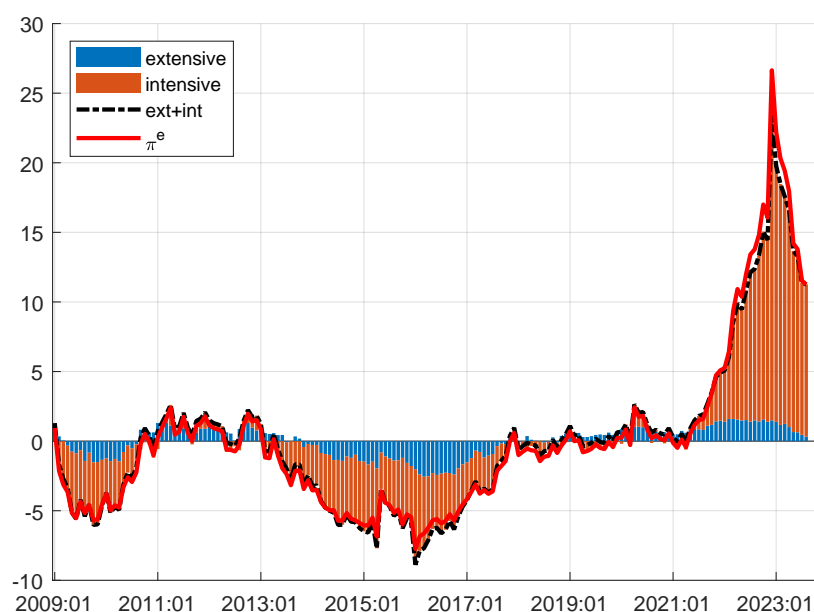
Figure 5: Decomposition of inflation expectations into the intensive and extensive margin

<u>Notes:</u> This figure illustrates the decomposition of de-meaned inflation expectations into the intensive and extensive margins, following the approach outlined by Klenow and Kryvtsov (2008) as described in the text. The blue bars represent the proportion of variation attributable to the changing share of individuals expecting non-zero inflation. The red bars show the proportion due to the varying levels of expected inflation, conditional on the expectation of non-zero inflation initially. The sample period covers January 2009 through August 2023.

Using this relationship yields the decomposition in Figure 5.

Note that considering a first-order approximation during periods of large deviations from the average inflation expectation can lead to an imprecise decomposition of inflation expectations into the extensive and intensive margin. As can be seen in Figure 5, there is indeed a difference during periods of large deviations between the red solid line which is the original time series of the average inflation expectation over time and the black dashed line which is the sum of the extensive and intensive margin. However, the decomposition can still explain the major part of average inflation expectation and can be considered as a good starting point.

The decomposition of the expected inflation (equation (4)) can be used to further decompose the variance of inflation expectations:

$$var(\pi_t^e) = \underbrace{var(dp_t^e)\overline{fr^e}^2}_{\text{IM term}} + \underbrace{var(fr_t^e)\overline{dp^e}^2 + 2\,\overline{fr^e}\,\overline{dp^e}\,cov(fr_t^e, dp_t^e) + \mathcal{O}_t}_{\text{EM terms}}, \quad (5)$$

where $dp_t^e$ is the average expected inflation rate over the next 12 months among consumers expecting non-zero inflation, $fr_t^e$ is the share of consumers expecting non-zero inflation and the values with a bar correspond to time averages. $\mathcal{O}_t$ are higher-order terms that are functions of $fr_t^e$.[15]

This decomposition reveals that in Slovakia, 67% of the variance in expectations can be attributed to the intensive margin, with the remaining 33% accounted for by the extensive margin over the period from January 2009 to August 2023. It is noteworthy that the intensive margin becomes particularly significant when inflation deviates from its long-term mean, which, for the examined period in Slovakia, stands at 2.9%. Put differently, in periods of stable inflation around this long-run average — which, for Slovakia as an emerging economy, is above the ECB's inflation target of 2% — the extensive margin plays a significant role in explaining the fluctuations in inflation expectations, as observed for France by Andrade et al. (2023). However, during times of high inflation, low inflation, or deflation — essentially, when inflation rates are outside the low and stable range of 1-3% — it is the intensive margin that predominantly drives the aggregate fluctuations in quantitative inflation expectations.

Building on this analysis, we next explore whether consumption choices are

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[15]We attach the error to the EM term following Klenow and Kryvtsov (2008).

influenced more by the qualitative anticipation of higher or positive inflation (the extensive margin), as documented by Andrade et al. (2023), or by the levels of expected inflation, considering the critical role of the intensive margin in Slovakia.

# 4. INFLATION EXPECTATIONS AND ECONOMIC CHOICES

The impact of inflation expectations on household consumption and savings decisions is a critical empirical question rooted in economic theory. Higher subjective inflation expectations can significantly influence intertemporal consumption decisions in various ways. A decrease in the subjectively perceived real interest rate, as explained by the Fisher equation, might diminish the motive for savings while enhancing the incentive for consumption, according to the consumer Euler equation. However, negative wealth and income effects may offset the positive impact of higher inflation expectations on current consumption. Anticipating a monetary policy response, such as higher nominal rates, could also lead to a reduction in current consumption (Carvalho and Nechio, 2014). In times of elevated inflation uncertainty, which implies uncertainty about real income, a precautionary saving motive may further diminish current consumption (Binder, 2017). Finally, individuals might perceive higher inflation as an indicator of economic downturns from a supply-side perspective, leading them to reduce their consumption demand. This view is supported by various studies, including Coibion et al. (2023); Kamdar (2019).

Empirically assessing how inflation expectations affect the real consumption choices of households is challenging due to the issue of endogeneity. There exists a possibility that households perceive and consequently expect higher inflation due to their own increased spending. Bachmann et al. (2015) observed that for US consumers, the impact of higher quantitative inflation expectations on the readiness to spend on durables is minimal and even turns negative within the zero lower bound context. D'Acunto et al. (2022), (Dräger and Nghiem, 2021), Crump et al. (2022), and Andrade et al. (2023) identified a positive correlation between current durable consumption and inflation expectations. Both Andrade et al. (2023) and D'Acunto et al. (2022) emphasized that the qualitative aspect of inflation expectations, particularly the decision to anticipate rising or positive inflation, is crucial. D'Acunto et al. (2022) not only found a positive relationship in countries like Germany, Sweden, the UK, and France but also leveraged a natural experiment in Germany — an early announced VAT increase — to address potential endogeneity. Their findings revealed a significant causal effect of higher inflation expectations on durable consumption.

Utilizing a similar argument, Bachmann et al. (2021) leveraged an unexpected temporary reduction in value-added tax, complemented by customized survey and household scanner data, to explore the effects of inflation expectations. Their findings also indicate a strong causal effect of heightened inflation expectations on spending across various categories, including durable, semi-durable, and non-durable goods.

An alternative method to address the issue of endogeneity is through random-

ized information-provision experiments, as employed by Coibion et al. (2023) and Coibion et al. (2020). In their study, Coibion et al. (2023) observed a modest effect of induced higher inflation expectations on non-durable spending among Dutch households and a negative impact on durable spending. They interpret this result as a consequence of a decline in real income and aggregate demand expectations among households that revise their inflation expectations upward. This aligns with the stagflationary perspective previously discussed.[16]

In Slovakia, as previously mentioned, we observe a generally negative relationship between the proportion of people who believe it is the right time to purchase durables and the levels of actual and expected inflation, when considering aggregate, unconditional data. Figure 6 graphically represents this correlation, utilizing data from Table 1. This trend supports the notion of a stagflationary perspective among consumers, who often associate inflation with unfavorable economic conditions. However, as we explore in the next chapter, a deeper analysis at the individual level, using the detailed microstructure of the dataset, reveals a contrasting trend. Specifically, consumers tend to increase their propensity to consume when expecting inflation, although the magnitude of this effect varies depending on the prevailing inflation conditions.

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[16]In Section D.12, we present evidence supporting a stagflationary view among households in Slovakia. Nonetheless, even after accounting for perceptions of inflation and economic development expectations, we observe that consumers are inclined to increase their propensity to spend on durables in response to higher or positive inflation expectations.
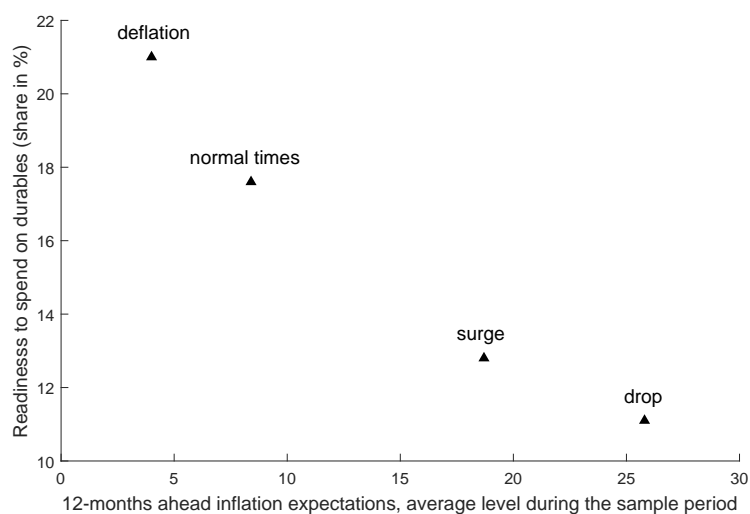
Figure 6: Unconditional correlation of inflation expectations with the readiness to spend

Notes: The figure displays the average time-series values, with the quantitative 12-month-ahead inflation expectations plotted on the horizontal axis, and the proportion of people responding 'It is the right time to purchase durables' during the sample periods represented on the vertical axis.

## 4.1. EMPIRICAL STRATEGY

In this section, our focus is on exploring whether consumers' consumption decisions are influenced by their inflation expectations, particularly during distinct periods characterized by varying levels of inflation. We aim to determine whether higher or positive inflation expectations positively influence durable expenditures, as suggested by the textbook Euler equation, and if this impact changes over time. This investigation differs from previous studies (such as those by Bachmann et al. (2015); D'Acunto et al. (2022); Andrade et al. (2023)) in that it specifically examines different sample periods, including the recent periods of inflation surge and deflation. Additionally, we incorporate a variety of indicators for inflation expectations, further distinguishing our analysis.

We utilize both qualitative and quantitative household inflation expectations in

our analysis. Following the approach of Andrade et al. (2023), we differentiate between extensive and intensive margins. The extensive margin pertains to the general expectation of positive inflation, while the intensive margin relates to the specific level of expected inflation, provided there is an expectation of positive inflation initially. Notably, the extensive margin can be subdivided into three categories: (1) expecting rising inflation, (2) expecting constant inflation, and (3) expecting positive inflation, but at a lower rate than in the previous 12 months.

This decomposition is key, as the strategies in D'Acunto et al. (2022) and Andrade et al. (2023) vary, focusing on different segments of the extensive margin. D'Acunto et al. (2022) concentrate on the proportion of consumers expecting rising inflation as their measure of inflation expectations. In contrast, Andrade et al. (2023) consider the entire extensive margin, encompassing individuals who anticipate any level of positive inflation.

To comprehensively analyze different expected inflation regimes and their driving factors, we incorporate all potential expectation measures. In line with D'Acunto et al. (2022), we develop a dummy variable, $\pi^e_{DHW}$, which is assigned the value of one if a household expects prices to increase more than in the previous year, indicating higher expected inflation. Similarly, following Andrade et al. (2023), we introduce a dummy, $EM_{AGM}$, for individuals anticipating any positive inflation over the next 12 months. By definition, $EM_{AGM}$ encompasses the $\pi^e_{DHW}$ measure.

Additionally, we create another variable representing cases where consumers expect at least constant inflation, thereby covering all facets of the extensive margin. This measure includes both the $\pi^e_{DHW}$ and $EM_{AGM}$ variables, capturing expectations of rising and at least constant inflation.

We model the readiness to purchase durable goods as a binary random variable $y$ that can take two values, $y \in \{0, 1\}$, where one denotes a good time to purchase durable goods and zero otherwise. We run a series of logit regressions to estimate the effect of higher inflation expectations, indicated by one of the inflation measures discussed above, on the probability of answering that it is the right time to purchase durable goods.

The response probability is defined as $P(y = u|X)$, where $u = 0, 1$ and $X$ is an $N$x$K$ vector where $N$ is the number of observations and $K$ is the number of regressors including an intercept. The $K - 1$ columns of $X$ (the first one is a unit vector) thus represent a set of household observables. These observables include one measure of inflation expectations at a time, alongside other control variables. Specifically, our controls encompass household demographics and expectations and perceptions, as well as levels of inflation and nominal interest rates. Demographic controls include gender, age, per capita income category, education, and employment status. Expectations cover a range of topics such as personal financial situation (Q1 and Q2), economic growth in Slovakia (Q4), unemployment (Q7), general financial status (Q12), current suitability for saving (Q10), and qualitative or quantitative inflation perceptions (Q5 and Q51). It is important to note that in our baseline setup, we control for quantitative per-

ceived inflation in regressions utilizing quantitative inflation expectation questions and for qualitative inflation perception in regressions with qualitative inflation expectation measures. We delve deeper into this approach in the robustness section. Additionally, we include time fixed effects in the form of yearly and monthly dummies.

Given the logit regression setup, we assume that the distribution of response probabilities is given by

$$P(y = u | X) = \frac{\exp(X\beta)}{1 + \exp(X\beta)}, \tag{6}$$

where $\beta$ is a $K$x1 vector of coefficients. The baseline category is $y = 0$ indicating *neither right nor wrong time* and *wrong time for durable consumption* together. We compute the marginal effects, evaluated at the sample mean, of changes in the covariates on the probability that households reply *it is the right to purchase durables*. Standard errors are clustered at the quarter level to control for any within quarter correlation of errors.

**Potential endogeneity issues**    Drawing from the detailed discussion provided in Andrade et al. (2023), whose empirical strategy we largely adopt, there are several potential identification issues which we briefly outline below.

First, there is a concern that the variation in households' inflation expectations across different individuals could be mainly driven by individual fixed effects (Vellekoop and Wiederholt, 2019). By controlling for a comprehensive set of individual characteristics, as well as individual qualitative or quantitative in-

flation perceptions, we aim to mitigate this issue.

Second, there could be reverse causality, where higher actual or planned durable consumption leads to increased inflation expectations. If this mechanism exists, it would likely operate through individually perceived inflation affecting inflation expectations, which is another justification for including inflation perceptions in our controls.

Third, the model might be affected by omitted time-varying variables. We address this by incorporating a detailed set of household-specific expectations and perceptions, including queries about the appropriateness of saving at present. Additionally, we control for the actual inflation rate, interest rates, and time fixed effects with both yearly and monthly dummies. This should help reduce the impact of any potential omitted variables or shocks that might simultaneously influence both inflation expectations and the propensity for durable consumption.

An important consideration is the direct accounting for an individual's perception of whether "it is the right time to save," as employed in the studies by D'Acunto et al. (2022) and Andrade et al. (2023). This could lead to over-identification since savings represent unspent income and, according to the Euler equation, consumers expecting higher inflation might be less inclined to view it as a good time to save. In Section D.13.4, we conduct a robustness check and find that including a control for the readiness to save doesn't significantly change our estimation results. However, it does contribute to a more accurate

fit in our regression analysis.

## 4.2. ESTIMATED EFFECTS OF INFLATION EXPECTA-TIONS ON PROPENSITY TO CONSUME DURABLE GOODS

The main findings are presented in Table 10, which shows the results of regressing the propensity to purchase durables on various inflation expectation indicators in different time samples. We display the estimated marginal effects, evaluated at sample means,[17] for different time periods across columns, and various measures of inflation expectations in rows (A)-(E).

Each row, from (A) to (E), represents a separate regression using a distinct inflation expectation indicator. $\pi^e_{DHW}$, following D'Acunto et al. (2022), indicates individuals reporting a higher inflation expectation over the next 12 months compared to the past 12 months. 'At least constant inflation' refers to a dummy for higher or constant qualitative inflation expectations. The extensive margin, as per Andrade et al. (2023), $EM_{AGM}$, marks individuals expecting any positive quantitative inflation, encompassing higher, constant, or lower but positive rates. For the impact of the level of expected inflation, $IM_{AGM}$, the regression includes only observations with positive inflation expectations, hence a smaller sample size (No. obs. IM). The final row combines all quantitative expectations, including zero and negative values, aggregating both intensive and extensive margins of inflation expectations.

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[17]Section E presents the average marginal effects, confirming robust and almost identical results.

| | | whole sample (1) | surge (2) | defl. times (3) | drop (4) | normal times (5) |
|---|---|---|---|---|---|---|
| | average $\pi_t$ | 2.9% | 9.7% | -0.3% | 12.1% | 2.1% |
| | average $\pi_t^e$ | 9.4% | 18.0% | 4.4% | 26.1% | 8.4% |
| | readiness to spend | 18.8% | 14.2% | 21.0% | 11.9% | 19.0% |
| | | | | Right time to purchase | | |
| (A) | higher inflation ($\pi_{DHW}^e$) | 0.033*** | 0.042*** | 0.013 | −0.008 | 0.035*** |
| | | (0.003) | (0.005) | (0.010) | (0.011) | (0.004) |
| (B) | at least constant inflation | 0.011*** | 0.035*** | 0.019** | −0.015* | 0.008* |
| | | (0.004) | (0.007) | (0.007) | (0.006) | (0.005) |
| (C) | $EM_{AGM}$ | 0.014*** | 0.019 | 0.024** | 0.024 | 0.011** |
| | | (0.004) | (0.016) | (0.008) | (0.021) | (0.005) |
| (D) | $IM_{AGM}$ | 0.001*** | 0.002*** | 0.001 | 0.000 | 0.001*** |
| | | (0.000) | (0.001) | (0.001) | (0.001) | (0.000) |
| (E) | all quant. $\pi^e$ | 0.001*** | 0.002*** | 0.002** | 0.001 | 0.001*** |
| | | (0.000) | (0.000) | (0.001) | (0.001) | (0.000) |
| | | | | Controls | | |
| | Demographics | X | X | X | X | X |
| | Expectations | X | X | X | X | X |
| | $\pi_t$ | X | X | X | X | X |
| | $i_t$ | X | X | X | X | X |
| | No. obs. | 119,387 | 11,322 | 23,877 | 3,185 | 81,003 |
| | No. obs. IM | 96,945 | 10,753 | 15,579 | 2,891 | 67,722 |

Standard errors, clustered at the quarter level, in parentheses.
Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2: Regression results of propensity to purchases durable goods

Notes: This table reports the estimated marginal effects of a binomial logit regression evaluated at the sample mean. Households' readiness to spend on durables, modelled as a dummy variable equal to one if answering it is right time to purchase durables and zero otherwise, is the dependent variable. There are four measures of inflation expectations: (A) a dummy variable ($\pi_{DHW}^e$) that equals one if a household expects inflation to increase à la D'Acunto et al. (2022), (B) a dummy variable that equals one if a household expects inflation to be at least constant, (C) a dummy variable ($EM_{AGM}$) equal to one if a person expects positive inflation (extensive margin) and (D) the subjective level of expected inflation ($IM_{AGM}$ - intensive margin) à la Andrade et al. (2023). Only one inflation expectations measure is employed in a regression at a time. We control for household demographics and household expectations as well as the level of inflation and nominal interest rates. Yearly and monthly fixed effects are included. Demographics include: gender, age, income category per capita, education, employment status. Expectations include: own financial situation, economic growth in Slovakia, unemployment, financial status, considering given time as the right time to save. We control for the quantitative perceived inflation in the regressions that use the quantitative inflation expectation questions and control for the qualitative inflation perception in the regressions using the qualitative inflation expectation measures. Time periods are as follows: (2) surge June 2021 - February 2023, (3) deflationary times January 2014 - December 2016, (4) drop March 2023 - August 2023, (5) remains are periods other than (2), (3) and (4).

In column (1), which represents the entire sample, we observe that anticipating higher inflation significantly increases the likelihood of respondents stating it is the right time to purchase durables by 3.3 percentage points compared to not

expecting an inflation increase. This finding aligns with D'Acunto et al. (2022), confirming a positive and significant influence of higher inflation expectations on the readiness to purchase durables. In the context of surging inflation (column 2) versus normal times (column 5), the estimated marginal effect increases from 3.5 to 4.2 percentage points. However, the relative significance of this change is more pronounced when considering the baseline probability of respondents affirming it is the right time to purchase durables. During periods of surging inflation, this unconditional probability is lower than in normal times, hence elevating the relative impact of expecting higher inflation. Specifically, while in normal times the likelihood increases by 28% with higher inflation expectations, during surging inflation periods it increases by 40% (from 10.5% to 14.5%). Notably, the marginal effect is not significant during deflationary times and the period of declining inflation in 2023.

Beyond the state-dependent effects of inflation expectations on the willingness to consume, the varying impacts across different anticipated inflation regimes are noteworthy. The effect of expecting rising inflation is more pronounced than anticipating other inflationary scenarios. The influence of expecting higher inflation is more substantial during periods of surging inflation compared to deflationary periods. In contrast, the general expectation of positive inflation shows significant influence during deflationary times but not in times of surging inflation. This pattern suggests that people tend to perceive inflation in terms of distinct regimes and factor in the dynamics of inflation when making decisions.

In the context of the inflation decline in 2023, we do not observe a positive effect of either quantitative or qualitative inflation expectations on consumption tendencies. If anything, the expectation of at least constant inflation appears to have a significantly negative impact.

In the following, we compare the explanatory power of qualitative inflation expectations relative to expected levels and changes in inflation.

**Qualitative regimes versus expected inflation levels**  The question arises as to whether qualitative regimes are more influential than the quantitative levels of expected inflation in determining consumption propensity. Although the coefficients on $IM_{AGM}$ are relatively small in absolute terms – due to quantitative inflation expectations being expressed in percentage points (e.g., 5% rather than 0.05) – the extensive margin, representing the qualitative aspect, appears to play a more crucial role than the intensive margin, which reflects the quantitative aspect. This can be illustrated in two ways.

First, consider two respondents who both expect positive inflation: one expects 5% and the other 15%. During periods of surging inflation, the second respondent is estimated to have a 1 percentage point higher likelihood of reporting it is the right time to purchase durables. This effect, though significant, is smaller than the impact of expecting qualitatively positive inflation, highlighting the dominant role of the extensive margin.

Second, when these expectations are evaluated at average quantitative levels, by multiplying the average inflation expectation in a given sample period with

the estimated marginal effect, the impact of average inflation compared to zero inflation is still smaller than that of the dominant qualitative regimes in the same period. For example, in normal times, this effect is 0.84 percentage points, which is considerably lower than the effect of expecting higher inflation (3.5 percentage points) or expecting positive inflation in general (1.1 percentage points).

**Qualitative regimes versus expected changes in inflation levels**   The comparison relative to changes in expected inflation is novel, as D'Acunto et al. (2022) do not use individual data on quantitative levels of expected and perceived inflation, and Andrade et al. (2023) do not explore the explanatory power of individually expected changes in inflation.

Qualitative inflation expectations can be viewed as directional expectations, as they reflect household anticipations about inflation changes. Rather than discussing their significance solely in relation to expected inflation levels – whether as the intensive margin like in Andrade et al. (2023) or encompassing the entire cross-section including negative and zero levels as in Bachmann et al. (2015) – it may be more insightful to compare their importance with the expected change in inflation.

Our dataset facilitates this exercise, as it allows us to calculate the expected change in inflation at the individual level by comparing the expected and perceived inflation levels (Q61 - Q51).

The regression results shown in Table 3 includes the difference between indi-

vidual quantitative inflation expectations and perceptions in the regression. Interestingly, when compared to results in Table 10, the quantitative change in expected inflation level does not eliminate the effect of qualitative expectations of higher inflation. However, it does render the impact of expecting positive inflation, i.e., the extensive margin, insignificant both during normal times and in the entire sample. Moreover, during periods of declining inflation, expecting higher or at least constant inflation tends to decrease the propensity for consumption.

These findings support the observation of a state-dependent impact of qualitative inflation expectations, particularly the expectation of higher inflation. They also indicate that the explanatory power of qualitative expectations surpasses that of quantitative levels and changes.

## 4.3. ROBUSTNESS

The way we control for perceived inflation significantly influences the results concerning the extensive and intensive margins. In our baseline regressions, following the method used by Andrade et al. (2023), we control for quantitative perceived inflation in regressions employing quantitative inflation expectation questions, and for qualitative inflation perception in regressions utilizing qualitative expectation measures. This approach stems from the observation that the distributions of quantitative inflation expectations, conditional on subsets of the extensive margin, largely overlap. Consequently, the level of expected inflation is not sufficient to differentiate between qualitative regimes. Figure 7 illustrates

|  |  | whole sample | surge | defl. times | drop | remains |
|---|---|---|---|---|---|---|
|  |  | (1) | (2) | (3) | (4) | (5) |
|  | average $\pi_t$ | 2.9% | 9.1% | -0.3% | 12.3% | 2.1% |
|  | readiness to spend | 18.8% | 14.5% | 21.0% | 11.9% | 19.0% |
|  |  | Right time to purchase | | | | |
| (A) | higher inflation ($\pi^e_{DHW}$) | 0.030*** | 0.033*** | 0.003 | −0.015*** | 0.037*** |
|  |  | (0.003) | (0.006) | (0.010) | (0.006) | (0.004) |
| (B) | at least constant inflation | 0.004 | 0.018** | 0.013** | −0.031*** | 0.003 |
|  |  | (0.004) | (0.008) | (0.006) | (0.007) | (0.005) |
| (C) | $EM_{AGM}$ | 0.007 | −0.017 | 0.019** | 0.021 | 0.005 |
|  |  | (0.005) | (0.024) | (0.008) | (0.022) | (0.006) |
|  |  | Controls | | | | |
|  | Demographics | X | X | X | X | X |
|  | Expectations | X | X | X | X | X |
|  | $\pi_t$ | X | X | X | X | X |
|  | $i_t$ | X | X | X | X | X |
|  | No. obs. | 119,387 | 11,322 | 23,877 | 3,185 | 81,003 |
|  | No. obs. IM | 96,945 | 10,753 | 15,579 | 2,891 | 67,722 |

Standard errors, clustered at the quarter level, in parentheses.
Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3: Regression results of propensity to purchases durable goods when controlling for the expected change in inflation

Notes: This table reports the estimated average marginal effects of a binomial logit regression evaluated at the sample mean. Households' readiness to spend on durables, modelled as a dummy variable equal to one if answering it is right time to purchase durables and zero otherwise, is the dependent variable. There are five measures of inflation expectations where the first three indicators are based on qualitative answers and the remaining two indicators are based on quantitative answers: (A) a dummy variable ($\pi^e_{DHW}$) that equals one if a household expects inflation to increase à la D'Acunto et al. (2022), (B) a dummy variable that equals one if a household expects inflation to be at least constant, (C) a dummy variable that equals one if a household expects positive inflation, (D) a dummy variable ($EM_{AGM}$) equal to one if a person expects quantitative positive inflation (extensive margin) and (E) the subjective level of expected inflation ($IM_{AGM}$ - intensive margin) à la Andrade et al. (2023). Only one inflation expectations measure is employed in a regression at a time. We control for household demographics and household expectations as well as the level of inflation and nominal interest rates. Yearly and monthly fixed effects are included. Demographics include: gender, age, income category per capita, education, employment status. Expectations include: own financial situation, economic growth in Slovakia, unemployment, financial status, qualitative inflation perceptions, considering given time as the right time to save. *Additionally, we include as a control variable the individual difference between the quantitative inflation expectation and perception.* Time periods are as follows: (2) surge June 2021 - February 2023, (3) deflationary times January 2014 - December 2016, (4) drop March 2023 - August 2023, (5) remains are periods other than (2), (3) and (4).

this overlap through two example months: December 2019, representing a period of normal inflation, and December 2022, when inflation expectations were at their peak.

In Section D.13 we report results when controlling only for (1) qualitative per-
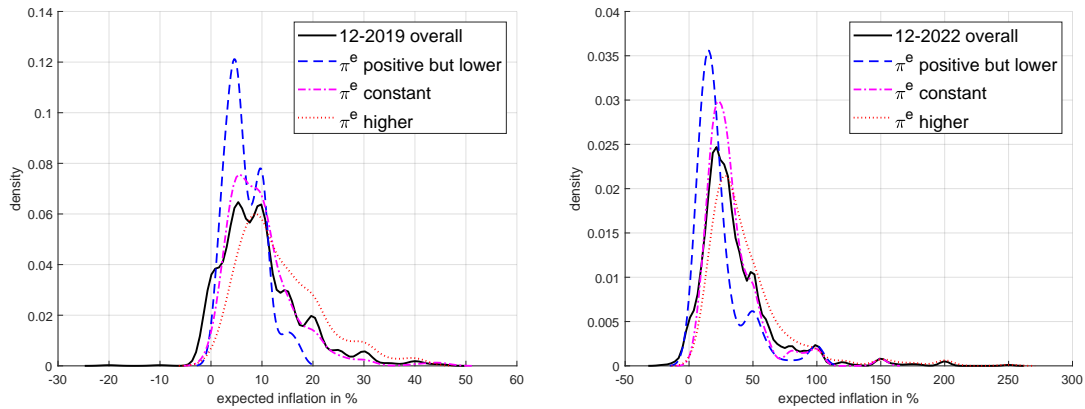
Figure 7: Distributions of quantitative expectations conditionally on qualitative regimes

Notes: The figures show the distribution of quantitative inflation expectations for the whole cross-section and conditional on three qualitative inflation expectations regimes, that are (1) expecting higher inflation for the next 12 months than in the last 12 months, (2) constant inflation, or (3) positive but lower inflation. The left panel shows the conditional distributions in December 2019 and right panel in December 2022. While the aggregates are internally consistent, i.e. the average quantitative answer given by someone who qualitatively expects prices to increase "more rapidly" is higher than those who expect them to increase at the "same" or "slower" rate, there is considerable overlap between the categories acro

ceptions, (2) quantitative perceptions and (3) no perceptions of inflation at all. The significance regarding the time-varying impact of anticipated rising or at least constant inflation regimes remains robust. Furthermore, we also illustrate how including explanatory variables one by one at a time changes the results in the appendix in Section D.13.5.

## 4.4. "I DO NOT KNOW" INFLATION EXPECTATIONS

In the following, we aim to test the hypothesis that individuals who respond to the question about the expected evolution of consumer prices over the next 12 months with "I do not know" may not adhere to the Euler-equation rationale. Instead, they might be driven by a precautionary savings motive due to higher uncertainty.

This hypothesis is based on the idea that individuals who cannot provide a

qualitative assessment of inflation's future course over the next 12 months may not respond in accordance with the Euler equation, which implies an increase in consumption due to a lower real interest rate. We specifically test this hypothesis for households that answer the question regarding perceived inflation and are thus aware of the prevailing inflation but are unable to form an expectation about it for the next 12 months.

This conditioning follows the rationale that even though households might be more attentive to inflation at times of high or accelerating inflation, the uncertainty about its future path might lead them to lower their consumption rather than increasing it. As suggested by Bracha and Tang (2022), a direct measure of attention to inflation is the share of consumers who do not respond to the question on perceived inflation with "I do not know," indicating their attentiveness to inflation. As observed in the left panel of Figure 8, the share of households attentive to inflation closely tracks the recent increase in inflation.

In a similar vein, we could think of the share of people answering the question on expected inflation by "I do not know" but conditionally on answering the question on perceived inflation as a measure of uncertainty. The right panel of Figure 8 shows this measure of uncertainty against the actual inflation rate. As we can see, the suggested measure indicates recently a rising uncertainty about future inflation path despite higher inflation attention.

To estimate the impact of uncertainty about expected inflation on the readiness to consume, we introduce a dummy variable which equals one when house-

holds answered *"I do not know"* to the question on qualitative inflation expectation conditionally on answering the question on perceived inflation. We follow the same logit regression setup as before with the difference that we regress the probability of answering it is the right time to purchase durables goods on having no explicit inflation expectation.
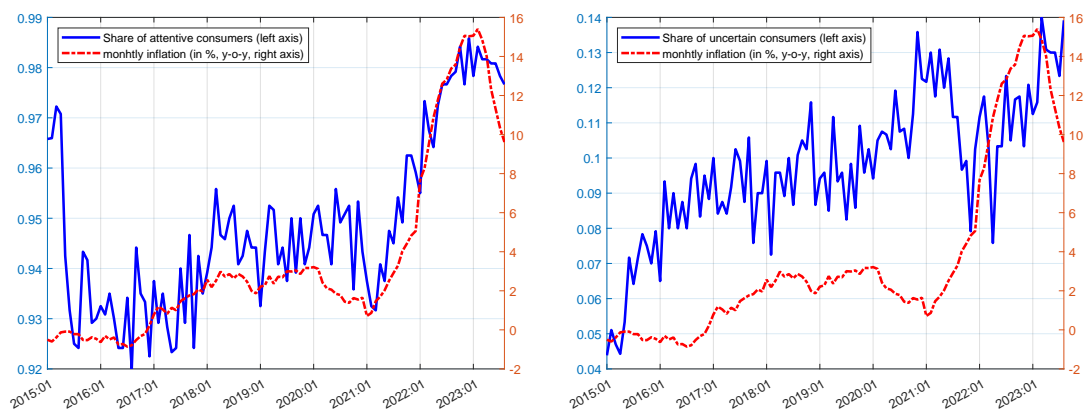


Figure 8: Inflation attention and inflation uncertainty

Notes: The left panel shows that attention to inflation measure of Bracha and Tang (2022) calculated as the share of consumers at a time who do not answer the question on qualitative inflation perception with "I do not know." The right panel shows an uncertainty measure about future inflation calculated as a share of respondents not answering the question on expected inflation conditionally on answering the question about perceived inflation.

The results confirm our hypothesis. Table 4 presents these findings alongside the previously discussed evidence on anticipating higher inflation.[18] We note that individuals with no inflation expectations are more likely to reduce their readiness to purchase durables, especially during periods of surging inflation. This observation suggests not only a regime-specific Euler equation but also a more varied decision-making process at the household level.

These findings are in line with Binder (2017), who demonstrates that inflation

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[18]The sample size has increased because we now also include individuals who provided "don't know" (DK) responses. These were previously excluded in the baseline setup.

uncertainty — indicated by responses with rounded numbers for expected inflation — tends to dampen spending attitudes on durables, cars, and homes. Our analysis differs by focusing on individual inflation uncertainty, specifically measured by the absence of expectations about future inflation. Collectively, these results support the idea that uncertainty adversely affects household decision-making (Coibion et al., 2021).

For completeness, it is important to consider whether this result could be driven by systematically different characteristics of respondents who report higher versus no inflation expectations. Descriptive statistics for all variables used as controls in the regressions for the two pools of respondents during the inflation surge period are reported in the appendix in Section D.14. During this period, the difference in consumption patterns is most striking. However, as shown in Section D.14, there do not appear to be any major differences between the samples other than their inflation expectations.

|  | whole sample | surge | defl. times | drop | remains |
|---|---|---|---|---|---|
|  | (1) | (2) | (3) | (4) | (5) |
| | Right time to purchase | | | | |
| $\pi^e_{DHW}$ | 0.034*** | 0.045*** | 0.013 | −0.004 | 0.036*** |
|  | (0.003) | (0.005) | (0.010) | (0.010) | (0.004) |
| $\pi^e_{Don't\,know}$ | −0.035*** | −0.056*** | −0.012 | −0.035** | −0.033*** |
|  | (0.008) | (0.012) | (0.021) | (0.017) | (0.010) |
| | Controls | | | | |
| Demographics | X | X | X | X | X |
| Expectations | X | X | X | X | X |
| $\pi_t$ | X | X | X | X | X |
| $i_t$ | X | X | X | X | X |
| No. obs. | 122,681 | 11,902 | 24,533 | 3,385 | 82,861 |

Standard errors, clustered at the quarter level, in parentheses.
Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: Regression results of having no inflation expectations on the readiness to purchase durable goods

Notes: This table reports the estimated average marginal effects of a binomial logit regression evaluated at the sample mean. Households' readiness to purchase durables is the dependent variable. Demographics include: gender, age, income category per capita, education, employment status. Expectations include: own financial situation, economic growth in Slovakia, unemployment, financial status, considering given time as the right time to save and perceived inflation. Yearly fixed effects are included if applicable. Time periods are as follows: (2) surge June 2021 - February 2023, (3) deflationary times January 2014 - December 2016, (4) drop March 2023 - August 2023, (5) remains are periods other than (2), (3) and (4).

# 5. PREDICTIVE POWER OF INFLATION EXPECTATIONS MEASURES FOR ACTUAL INFLATION

Andrade et al. (2023) show that the extensive margin accounts for the strong correlation between the average inflation expectation of households and actual inflation and is thus a stronger predictor of current inflation than the intensive margin. They do so by regressing realized inflation in period $t$ on inflation expectations in period $t$ for the next 12 months. In the following we follow their approach and enrich the exercise by employing the higher inflation expectations measure à la D'Acunto et al. (2022) to assess the predicting power of this subset of the extensive margin for inflation in Slovakia.

Figure 9 shows the time series over time and Table 5 presents the OLS regressions of the Slovak HICP year-on-year inflation at date $t$ on its own lag and time series variables constructed from micro data of the household survey also at date $t$.

We come to the same conclusion as Andrade et al. (2023) that the variations in the share of households expecting positive inflation (extensive margin) are a stronger predictor of current inflation realizations than the intensive margin. However, the qualitative measure of D'Acunto et al. (2022) is a very good predictor too and as shown in the last column of Table 5, it turns out to be a preferred explanatory variable. This result is interesting from a perspective
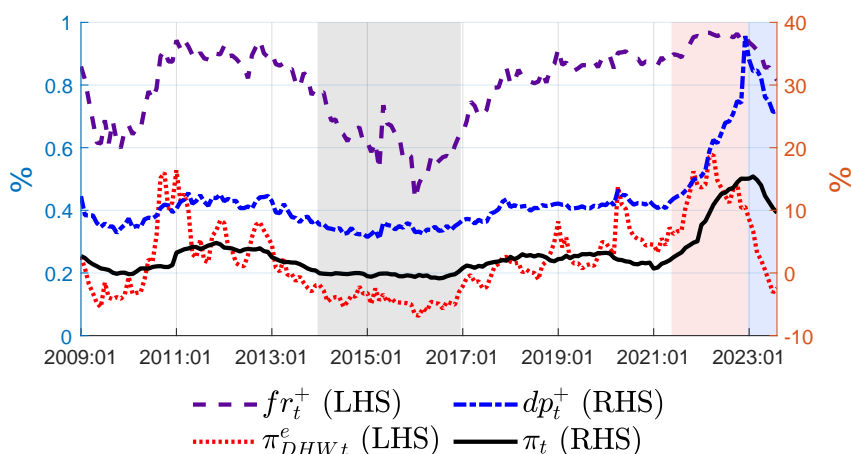
Figure 9: Inflation expectations measures over time

Notes: This figure shows the time series of the share of people expecting positive inflation, i.e. the extensive margin, $ft_t^+$; the average level of expected inflation conditional on expecting positive inflation, i.e. the intensive margin, $dp_t^+$; the share of people expecting for the next 12 months higher inflation than in the previous 12 months, i.e. the measure à la D'Acunto et al. (2022), which is a subset of the extensive margin; and the actual monthly headline HICP inflation rate, y-o-y, in percentage points. Sample period: January 2009 - August 2023.

of a researcher not having access to micro data on inflation expectations since it shows that using the share of people expecting higher inflation, which is a publicly available balance, as an indicator of inflation expectations to improve forecasting accuracy of actual inflation might be as good as using the extensive margin.

|  | Effect on current inflation | | | |
|---|---|---|---|---|
|  | (1) | (2) | (3) | (4) |
| $\pi_{t-1}$ | 0.889*** | 0.977*** | 0.965*** | 1.016*** |
|  | (0.036) | (0.038) | (0.010) | (0.033) |
| $\pi_t^e$ | 0.073*** |  |  |  |
|  | (0.022) |  |  |  |
| $EM_{AGM,t}$ |  | 0.948*** |  | $-1.946$*** |
|  |  | (0.342) |  | (0.464) |
| $IM_{AGM,t}$ |  | 0.004 |  | $-0.024$ |
|  |  | (0.024) |  | (0.021) |
| $\pi_{DHW,t}^e$ |  |  | 2.153*** | 3.632*** |
|  |  |  | (0.298) | (0.409) |
| $R^2$ | 0.986 | 0.986 | 0.989 | 0.990 |
| No. obs. | 175 | 175 | 175 | 175 |

Standard errors in parentheses.
Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5: Predicting power of inflation expectations measures

Notes: This table shows the result of OLS regressions of the Slovak HICP y-o-y inflation at date $t$ on its own lag, $\pi_{t-1}$, and time series variables constructed from micro data of the household survey. The time period comprises the whole sample period between January 2009 and August 2023. In column (1), the regressor is the average of all inflation expectations measured at date $t$, $\pi_t^e$. In column (2), the explanatory variables are the share of households expecting positive inflation and the average inflation expectation calculated among households expecting positive inflation, i.e. the extensive and the intensive margin of inflation expectations à la Andrade et al. (2023), respectively. In columns (3), the regressor is the share of households expecting higher inflation than during past 12 months, i.e. the expectations measure of D'Acunto et al. (2022). In column (4), all inflation expectations measures are used in parallel.

# 6. CONCLUSION

This paper examines how inflation expectations influence household consumption in different inflation scenarios. Using survey data from the EC consumer survey in Slovakia, we find that beyond the conventional quantitative-qualitative distinction in inflation expectations, differentiating among qualitative expectations is crucial. Qualitative expectations, more than quantitative levels, significantly shape consumption choices, and the relevance of specific qualitative expectations is contingent on prevailing inflation conditions. Higher inflation expectations increase spending, especially during inflationary periods, but lack significance during deflation or times of declining inflation. On the other hand, the absence of explicit inflation expectations diminishes consumption propensity due to increased uncertainty.

Qualitative inflation expectations, reflecting household anticipations of inflation trends, can be considered directional expectations. Our findings regarding the state-dependent impact of inflation expectations over time, and the varying significance of different qualitative regimes, remain valid even when controlling for the expected quantitative change in inflation. Hence, the information content of qualitative expectations as directional expectations extends beyond that of expected quantitative changes.

The state-dependent impact of inflation expectations is accompanied by another important observation: outside of the low and stable inflation region (1-3%), the intensive margin, not the extensive margin, drives the variance of

aggregate inflation expectations. Still, it is the extensive margin and its subsets that dominate the expected levels of inflation in influencing the propensity to consume. Our findings, therefore, extend the evidence in Andrade et al. (2023) and D'Acunto et al. (2022) for periods of deflation, surging inflation, and declining inflation. Furthermore, we highlight the role of different expected inflation regimes, and our results support regime- and agent-specific Euler equations.

These findings have implications for monetary policy. If people tend to react more strongly to inflation expectations during periods of surging inflation, central banks may need more proactive interventions. However, given the overall negative relationship between consumption propensity and the level of actual and expected inflation, this poses a challenge for central bank policies. The results, particularly regarding the extensive and intensive margins, suggest that central banks might be more effective in shaping inflation expectations by communicating the overall tendency of inflation to remain constant, decrease, or increase rather than focusing solely on specific inflation levels. Additionally, our findings indicate that discussions on the de-anchoring of inflation expectations could benefit from incorporating patterns observed in qualitative inflation regimes, providing valuable insights into consumers' willingness to spend.

What theoretical models could explain the state-dependent impact of inflation expectations on consumption choices, as identified in this paper? An implication of our findings is that consumers not only become more attentive to inflation during periods of increase but also respond more intensely to it. A promising avenue for explaining these time-varying effects might lie in mod-

els of endogenous information acquisition.[19] These models can also potentially clarify why the influence of inflation expectations on private consumption primarily operates through the extensive margin and its components, by discretizing the set of choices available to consumers, as suggested by Matějka (2015). The differentiation between quantitative and qualitative inflation expectations, and integrating these distinctions into monetary models, represents an interesting avenue for further research.

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[19]See, for example, Maćkowiak and Wiederholt (2009) or Coibion and Gorodnichenko (2015).

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# D. APPENDIX

## D.1. INFLATION MOMENTS IN DIFFERENT STUDIES

| Country | Mean | Median | Std |
|---|---|---|---|
| *D'Acunto et al. (2022): Jan 2000 - Feb 2016* | | | |
| Germany | 1.57 | 1.55 | 0.80 |
| France | 1.65 | 1.80 | 0.90 |
| Sweden | 1.50 | 1.37 | 0.90 |
| UK | 2.05 | 1.93 | 1.17 |
| *Andrade et al. (2023): Jan 2004 - Dec 2018* | | | |
| France | 1.50 | 1.60 | 0.97 |
| *This paper: Jan 2009 - August 2023* | | | |
| Slovakia | 2.88 | 1.86 | 3.81 |
| Germany | 2.16 | 1.54 | 2.45 |
| France | 1.74 | 1.33 | 1.79 |
| Sweden | 2.10 | 1.55 | 2.31 |
| UK | 2.89 | 2.42 | 2.51 |

Table 6: Inflation moments in different studies

## D.2. SURVEY QUESTIONS

1. How has the **financial situation of your household** changed over the last 12 months? It has ...

   - Got a lot better

   - Got a little better

   - Stayed the same

   - Got a little worse

   - Got a lot worse

   - Don't Know

2. How do you expect the financial position of your household to change over the next 12 months? It will ...

   - Get a lot better

   - Get a little better

   - Stay the same

   - Get a little worse

- Get a lot worse

- Don't Know

3. How do you think the **general economic situation in Slovakia** has changed over the past 12 months? It has ...

   - Got a lot better

   - Got a little better

   - Stayed the same

   - Got a little worse

   - Got a lot worse

   - Don't Know

4. How do you expect the general economic situation in Slovakia to develop over the next 12 months? It will ...

   - Get a lot better

   - Get a little better

   - Stay the same

   - Get a little worse

   - Get a lot worse

   - Don't Know

5. How do you think **consumer prices** have developed over the last 12 months? They have ...

   - Risen a lot

   - Risen moderately

   - Risen slightly

   - Stayed about the same

   - Fallen

   - Don't Know

6. In comparison with the past 12 months, how do you expect consumer prices will develop in the next 12 months? They will ...

   - Increase more rapidly

   - Increase at the same rate

   - Increase at a slower rate

- Stay about the same

- Fall

- Don't Know

7. How do you expect the **number of people unemployed** in this country will change over the next 12 months? The number will ...

- Increase sharply

- Increase slightly

- Remain the same

- Fall slightly

- Fall sharply

- Don't Know

8. In view of the general economic situation, do you think now is the right time for people to make **major purchases such as furniture or electrical goods**?

- Yes, now is the right time

- It is neither the right time nor the wrong time

- No, it is the wrong time

- Don't Know

9. Compared to the last 12 months, do you expect to spend more or less money on major purchases such as furniture and electrical goods? I will aspend ...

- Much more

- A little more

- About the same

- A little less

- Much less

- Don't Know

10. In view of the general economic situation, do you think that now is?

- A very good time to save

- A fairly good time to save

- Not a good time to save

- A very bad time to save

- Don't Know

11. Over the next 12 months, how likely will you be to save any money?

- Very likely

- Fairly likely

- Not likely

- Not at all likely

- Don't Know

12. Which of these statements best describes the current financial situation of your household?

- We are saving a lot

- We are saving a little

- We are just managing to make ends meet on our income

- We are having to draw on our savings

- We are running into debt

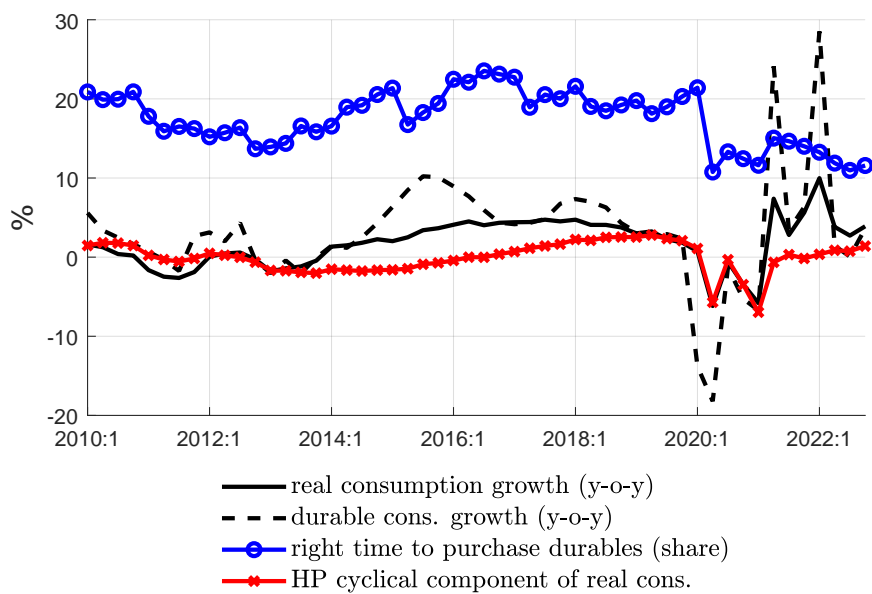- Don't Know

# D.3. SURVEY EVIDENCE AND DURABLE CONSUMP- TION



Figure 10: Growth of real overall and durable consumption vs survey evidence on durable decision

# D.4. DETAILED DESCRIPTIVE STATISTICS

| | | whole sample (1) | surge (2) | defl. times (3) | drop (4) | remains (5) |
|---|---|---|---|---|---|---|
| no. obs. | | 119,387 | 11,322 | 23,877 | 3,185 | 81,003 |
| **A. *Measures of inflation expectations and readiness to spend (sample shares)*** | | | | | | |
| readiness to buy durables | time series | 17.3% | 12.8% | 20.2% | 11.1% | 17.6% |
| | pool | 18.8% | 14.2% | 21.0% | 11.9% | 19.0% |
| inflation increase | | 27.5% | 50.8% | 13.9% | 22.9% | 28.5% |
| inflation at least constant | | 65.8% | 84.7% | 47.7% | 57.3% | 68.9% |
| share $\pi_t^e > 0$ (EM) | | 81.2% | 95.0% | 65.2% | 90.8% | 83.6% |
| average $dp_t^{e+} > 0$ | | 11.2% | 20.2% | 6.9% | 27.1% | 10.1% |
| **B. *Household demographics*** | | | | | | |
| gender | male | 47.9% | 47.7% | 48.1% | 47.5% | 47.9% |
| | female | 52.1% | 52.3% | 51.9% | 52.5% | 52.1% |
| age | 16-29 | 23.3% | 19.4% | 23.6% | 19.7% | 23.8% |
| | 30-49 | 38.9% | 40.0% | 38.7% | 40.8% | 38.7% |
| | 50-64 | 24.0% | 26.1% | 24.0% | 25.5% | 23.7% |
| | 65+ | 13.8% | 14.5% | 13.8% | 14.1% | 13.7% |
| education | primary | 16.1% | 12.9% | 16.2% | 12.0% | 16.6% |
| | secondary | 67.5% | 67.4% | 67.0% | 68.0% | 67.7% |
| | further | 16.4% | 19.7% | 16.9% | 20.0% | 15.7% |
| income category | 1st (lowest) quartile | 19.5% | 9.5% | 22.5% | 10.5% | 20.4% |
| | 2nd quartile | 25.7% | 25.0% | 26.2% | 25.7% | 25.7% |
| | 3rd quartile | 25.9% | 27.5% | 25.0% | 30.4% | 25.8% |
| | 4th quartile | 28.8% | 37.9% | 26.3% | 33.4% | 28.1% |
| employment status | active | 59.0% | 61.7% | 59.0% | 64.1% | 58.4% |
| | not active | 41.0% | 38.3% | 41.0% | 33.4% | 41.6% |
| **C. *Household expectations and perceptions*** | | | | | | |
| financial status | save a lot | 4.0% | 4.5% | 4.0% | 5.2% | 3.8% |
| | save little | 44.8% | 48.1% | 44.9% | 46.8% | 44.3% |
| | don't save | 33.6% | 34.5% | 32.5% | 35.7% | 33.7% |
| | dissave | 8.2% | 6.4% | 8.3% | 6.2% | 8.6% |
| | take on debt | 9.4% | 6.5% | 10.3% | 6.2% | 9.6% |
| past financial situation | improved substantially | 2.3% | 1.1% | 3.1% | 1.7% | 2.3% |
| | improved somewhat | 15.8% | 10.6% | 20.0% | 13.2% | 15.4% |
| | identical | 45.2% | 51.7% | 45.0% | 45.8% | 44.3% |
| | worsened somewhat | 25.3% | 27.2% | 22.4% | 28.3% | 25.8% |
| | worsened substantially | 11.4% | 9.5% | 9.6% | 11.0% | 12.2% |
| financial outlook | improves substantially | 1.2% | 0.8% | 1.7% | 1.0% | 1.1% |
| | improves somewhat | 13.8% | 9.0% | 17.7% | 10.6% | 13.4% |
| | identical | 54.9% | 57.5% | 57.0% | 57.4% | 53.7% |
| | worsens somewhat | 22.5% | 23.9% | 18.0% | 23.6% | 23.6% |
| | worsens substantially | 7.6% | 8.8% | 5.6% | 7.4% | 8.0% |
| savings good times | yes | 28.7% | 27.3% | 32.0% | 27.0% | 28.0% |
| economic outlook | improves substantially | 0.7% | 0.7% | 0.9% | 0.6% | 0.7% |
| | improves somewhat | 13.6% | 6.7% | 19.8% | 8.9% | 13.0% |
| | identical | 33.2% | 22.5% | 41.8% | 28.9% | 32.4% |
| | worsens somewhat | 35.1% | 38.9% | 28.5% | 38.2% | 36.4% |
| | worsens a lot | 17.3% | 31.3% | 9.0% | 23.5% | 17.5% |
| expected unemployment rate | increases substantially | 15.6% | 17.6% | 7.5% | 13.5% | 17.8% |
| | increases somewhat | 36.8% | 38.9% | 31.3% | 35.5% | 38.1% |
| | identical | 28.8% | 31.6% | 32.9% | 38.4% | 26.8% |
| | decreases somewhat | 17.9% | 11.2% | 27.1% | 11.9% | 16.3% |
| | decreases a lot | 1.0% | 0.8% | 1.2% | 0.7% | 1.0% |
| **D. *Macro variables (times-series averages)*** | | | | | | |
| average $\pi_t$ | | 2.9% | 9.7% | -0.3% | 12.1% | 2.1% |
| average $i_t$ | | 4.8% | 2.6% | 5.1% | 5.1% | 5.1% |

Table 7: Descriptive statistics
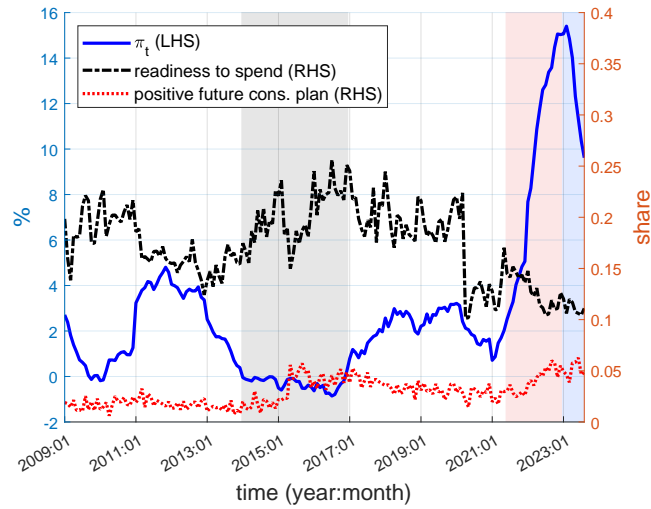
Figure 11: Share of people reporting good time for durable purchases over time

## D.5.  COMPARING THE FULL SAMPLE WITH THE SELECTED SAMPLE

|  |  | cleaned data (1) | raw data (2) |
|---|---|---|---|
| no. obs. |  | 119,387 | 191,081 |
| *Household demographics* |  |  |  |
| gender | male | 47.9% | 47.6% |
|  | female | 52.1% | 52.3% |
| age | 16-29 | 23.3% | 24.9% |
|  | 30-49 | 38.9% | 36.3% |
|  | 50-64 | 24.0% | 23.5% |
|  | 65+ | 13.8% | 15.4% |
| education | primary | 16.1% | 19.2% |
|  | secondary | 67.5% | 66.0% |
|  | further | 16.4% | 14.8% |
| employment status | active | 59.0% | 54.5% |
|  | not active | 41.0% | 45.3% |

Table 8: Descriptive statistics

## D.6.  EXPLAINING THE POSITIVE CORRELATION OF THE UPWARD BIAS WITH INFLATION

To assess the importance of certain product categories in driving inflation expectations, we regress the aggregate inflation expectations in time $t$ for 12 months ahead on the inflation rates in period $t$ in the 12 sub-groups of the HICP consumption basket. Following Campos et al. (2022), we apply the LASSO approach to not only estimate the importance of individual categories but also identify the ones with the highest explanatory power.

Figure 12 visualizes the evolution of the headline and food inflation rates against the aggregate inflation expectations.
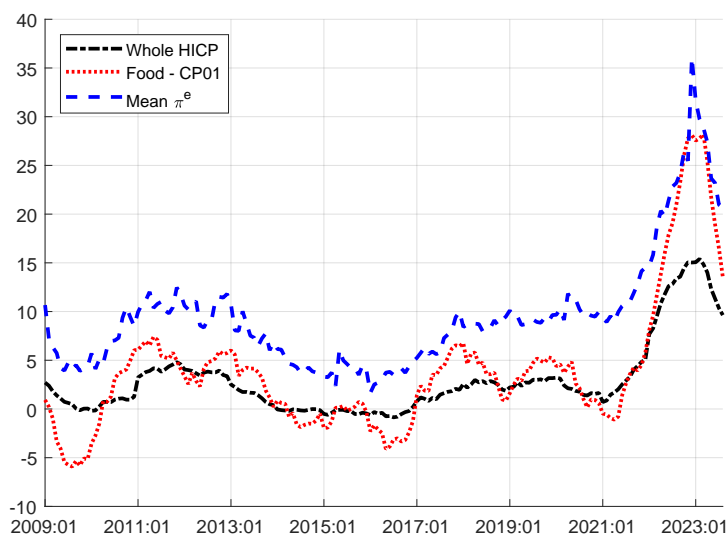


Figure 12: Food and headline inflation against aggregate inflation expectations

We use the regression results to decompose the variance of estimates to shares explained by selected categories. Figure 13 shows the results of the variance decomposition for the period prior to inflation surge, i.e. the period from January 2009 until May 2021 in the left panel and the for the inflationary period, June 2021 - August 2023, in the right panel.



pre-inflation surge period
2009:01 - 2021:05

surge period
2021:6 - 2023:8
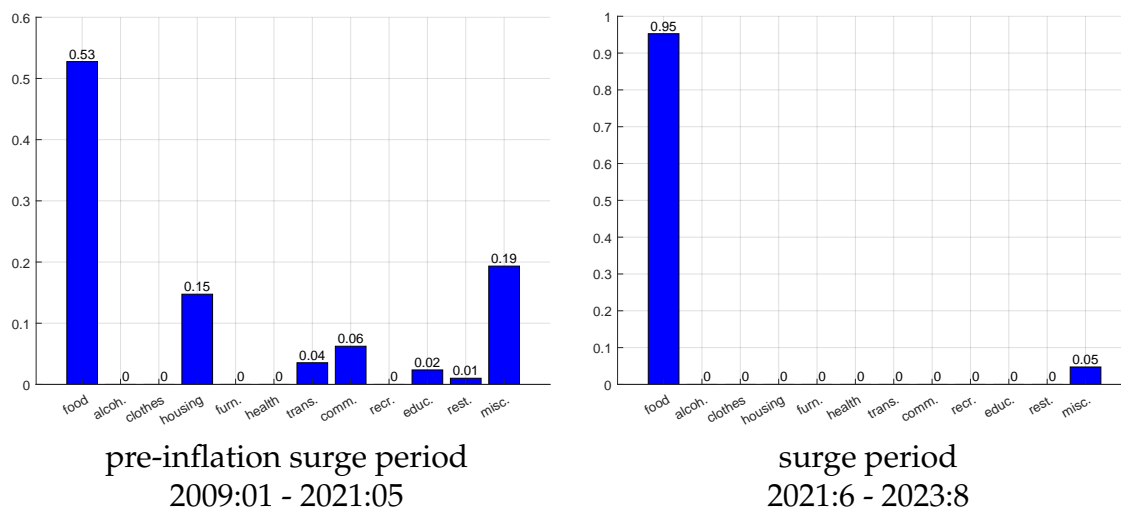
Figure 13: Moments of inflation perceptions vs expectations

The results show that while food inflation has been always the category with

the highest predictory power for inflation expectations in Slovakia, it basically became the almost exclusive driver of inflation expectations during the recent inflationary period. This result suggests that the positive correlation of the upward bias with inflation can be attrbiuted to a higher attention to certain items such as groceries. Also note that during the deflationary period, 2014-2016, the food inflation was on average lower than the headline inflation (see Figure 12).

## D.7. INTER-QUARTILE RANGE, SKEWNESS AND KURTOSIS OF INFLATION EXPECTATIONS OVER TIME
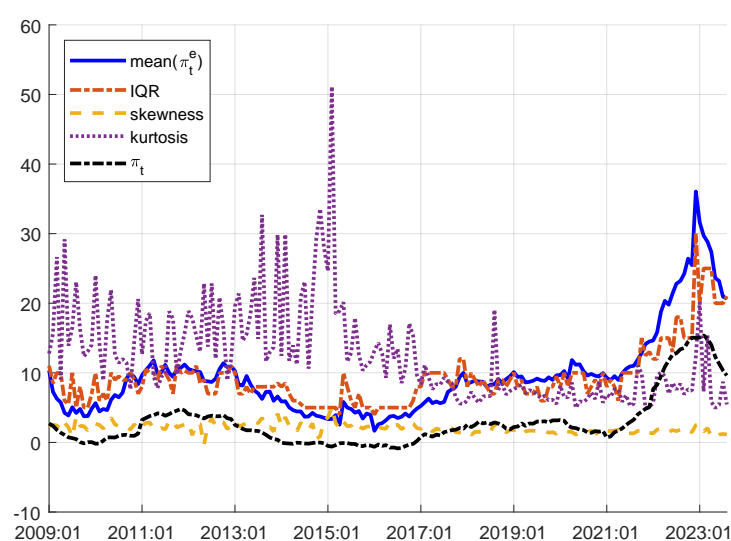


Figure 14: Further distributional moments over time

## D.8. CROSS-SECTIONAL FACTS

In line with D'Acunto et al. (2022) we document the following stylized facts for Slovakia. First, women hold systematically higher inflation expectations than men. Second, older people expect higher inflation. Third, poorer households expect higher inflation. Fourth, less educated people expect higher inflation. And fifth, unemployed people expect higher inflation. The same facts apply to inflation perceptions.

Table 9 provides an overview about the mean, median and standard deviation of the inflation expectations times series for different socio-economic groups.

|        | Perceived |        |      | Expected |        |      |
|--------|-----------|--------|------|----------|--------|------|
|        | mean | median | std | mean | median | std |
| TOT    | 9,78  | 8,99  | 7,08 | 9,48  | 8,83  | 6,04 |
| RE1    | 11,04 | 9,99  | 7,33 | 10,43 | 9,97  | 5,83 |
| RE2    | 9,93  | 9,12  | 7,04 | 9,58  | 9,01  | 5,99 |
| RE3    | 9,50  | 8,47  | 7,11 | 9,12  | 8,36  | 5,83 |
| RE4    | 8,53  | 7,67  | 6,77 | 8,30  | 7,63  | 5,79 |
| AG1    | 9,00  | 8,18  | 6,70 | 8,62  | 7,86  | 5,88 |
| AG2    | 9,56  | 8,70  | 7,00 | 9,24  | 8,56  | 5,87 |
| AG3    | 10,16 | 9,28  | 7,27 | 9,93  | 9,35  | 6,17 |
| AG4    | 10,99 | 10,17 | 7,69 | 10,63 | 10,06 | 6,56 |
| ED1    | 10,55 | 9,57  | 7,16 | 9,99  | 9,04  | 6,13 |
| ED2    | 9,80  | 9,03  | 7,14 | 9,50  | 8,96  | 6,07 |
| ED3    | 8,62  | 7,80  | 6,94 | 8,52  | 7,87  | 5,92 |
| MAL    | 9,60  | 8,75  | 6,98 | 9,30  | 8,62  | 5,98 |
| FEM    | 9,87  | 9,03  | 7,19 | 9,53  | 9,02  | 6,08 |
| EMP    | 9,54  | 8,55  | 6,93 | 9,25  | 8,40  | 5,93 |
| UNEMP  | 11,81 | 10,86 | 7,21 | 11,31 | 10,69 | 6,09 |

Table 9: Inflation expectations in different socio-economic groups

Notes: TOT denotes the overall sample. RE1 - RE4 denote the income groups where RE1 being the lowest income quartile. AG1-AG4 are the age groups where AG1 denotes 16-29 years old, AG2 30-49, AG3 50-64 and AG4 65+. ED1-ED3 are the educational levels where ED1 denotes the highest attained educational level to be the primary one and ED3 the tertiary one. MAL and FEM denote males and females, respectively. EMP and UNEMP denote employed and unemployed, respectively. Sample period 2009:01 - 2023:08.

Hence, the results for Slovakia confirm the empirical evidence in the literature for a substantial cross-sectional dispersion in households' inflation expectations which is systematically correlated with a set of socio-demographic characteristics. This underlies the importance of studying the determinants of households' inflation expectations.

# D.9. CO-MOVEMENT OF PERCEIVED AND EXPECTED INFLATION OVER TIME

Figure 15 shows the co-movement of the mean, median, mode and standard deviation of inflation expectations and perceptions, respectively.



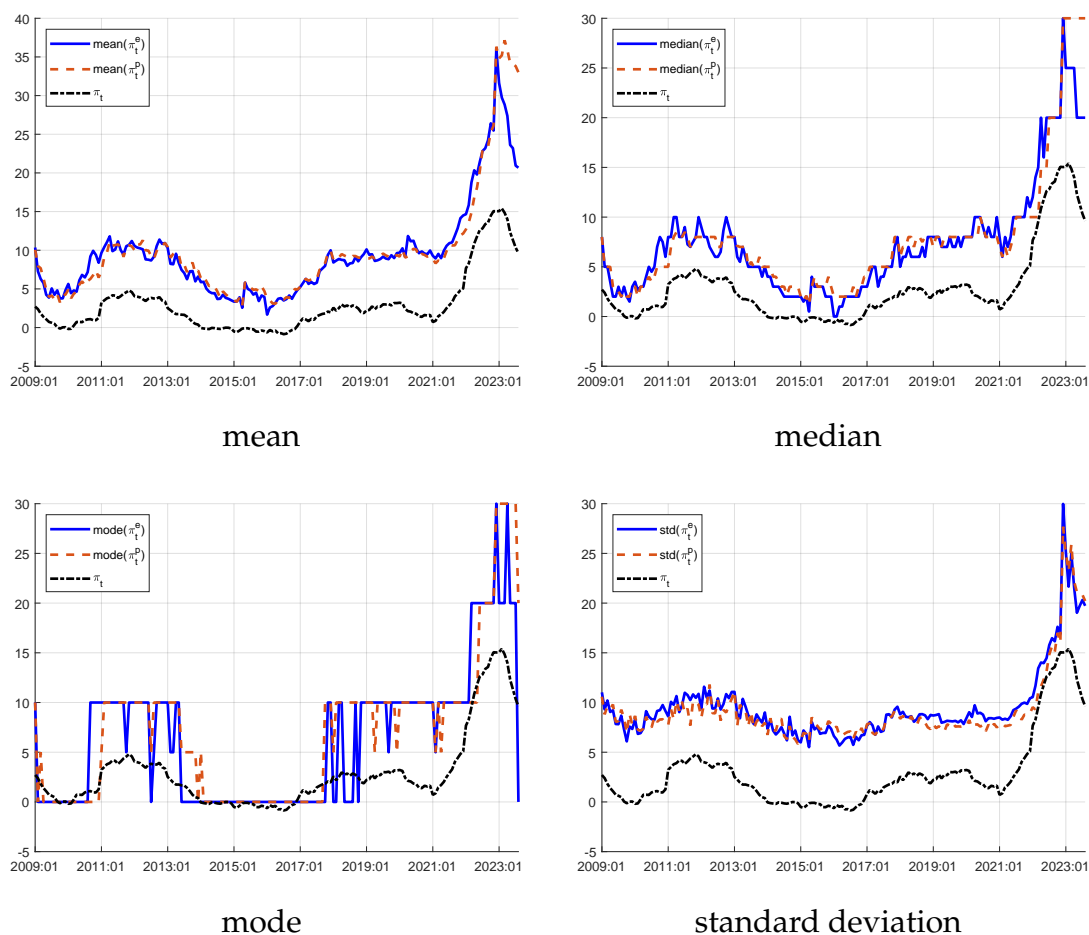mean

median

mode

standard deviation

Figure 15: Moments of inflation perceptions vs expectations

## D.10. CROSS-COUNTRY EVIDENCE ON CO-MOVEMENT OF QUALITATIVE INFLATION PERCEPTIONS AND EXPECTATIONS

Is the co-movement of inflation perceptions and expectations a Slovak phenomenon which holds only when considering quantitative expectations and perceptions? To address this question we utilize the questions on *qualitative* perceptions and expectations, i.e. questions 5 and 6 discussed in Section 2, for all EU countries. In particular, we use the balance of the answers as provided by the European Commission. This balance, not seasonally adjusted, is defined as

$$Balance = PP + P/2 - M/2 - MM, \tag{7}$$

where $PP$ stays for "risen a lot/increase more rapidly," $P$ for "risen moderately/increase at the same rate," $M$ for "stayed about the same/stay about the same" and $MM$ for "fallen/fall."

The two panels of Figure 16 show the relationships between qualitative and quantitative perceptions, expectations and the actual inflation, respectively. As we can see both qualitative as well as quantitative expectations and perceptions as elicited within the EC consumer survey strongly correlate with the actual inflation rate and with each other.

expectations
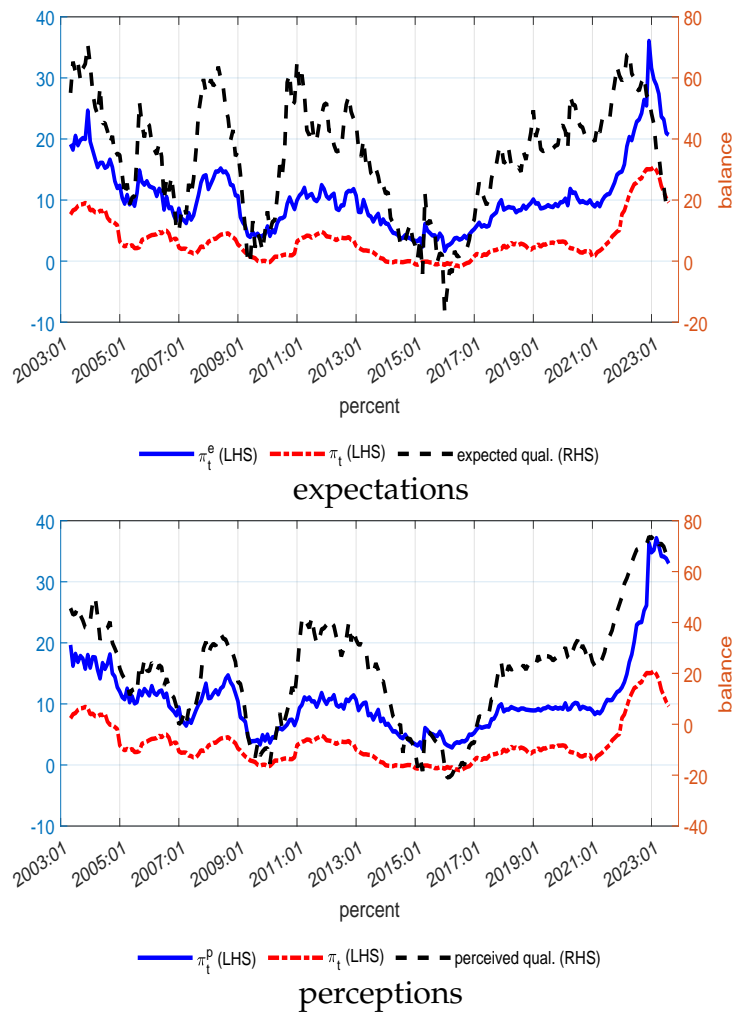


perceptions

Figure 16: Co-movement of qualitative and quantitative inflation perceptions and expectations

Figure 17 shows the correlations between qualitative and quantitative perceptions and expectations across different socio-economic groups. The strength of the relationship is slightly stronger for perceptions than for expectations, but overall the correlations range on average between 0.8 and 0.9 and imply thereby a strong co-movement of qualitative and quantitative replies.
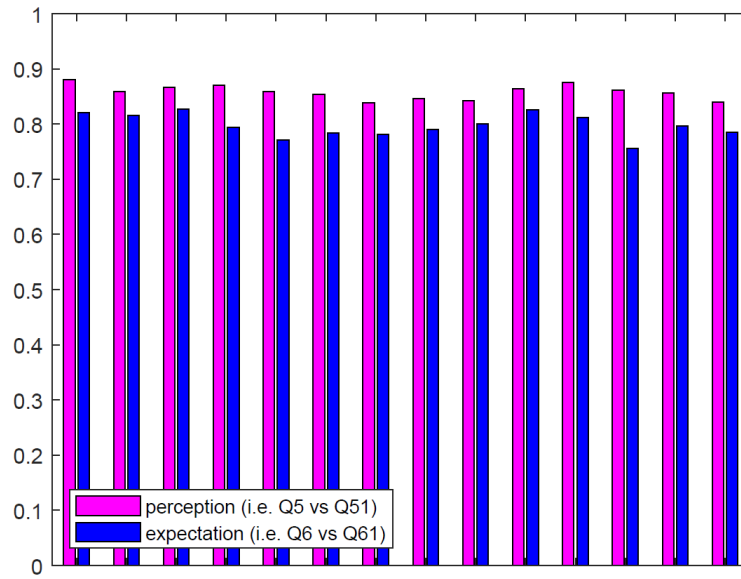
Figure 17: Correlation between qual. and quant. expectations among groups

Notes: TOT denotes the overall sample. RE1 - RE4 denote the income groups where RE1 being the lowest income quartile. AG1-AG4 are the age groups where AG1 denotes 16-29 years old, AG2 30-49, AG3 50-64 and AG4 65+. ED1-ED3 are the educational levels where ED1 denotes the highest attained educational level to be the primary one and ED3 the tertiary one. MAL and FEM denote males and females, respectively. EMP and UNEMP denote employed and unemployed, respectively.

Having discussed the co-movement of qualitative and quantitative answers, we now turn to using this strong link to document a strong co-movement of qualitative inflation perceptions and expectations. As can be seen from Figure 18, the observation of a strong co-movement of inflation perceptions and expectations is robust to using both qualitative as well as quantitative answers.
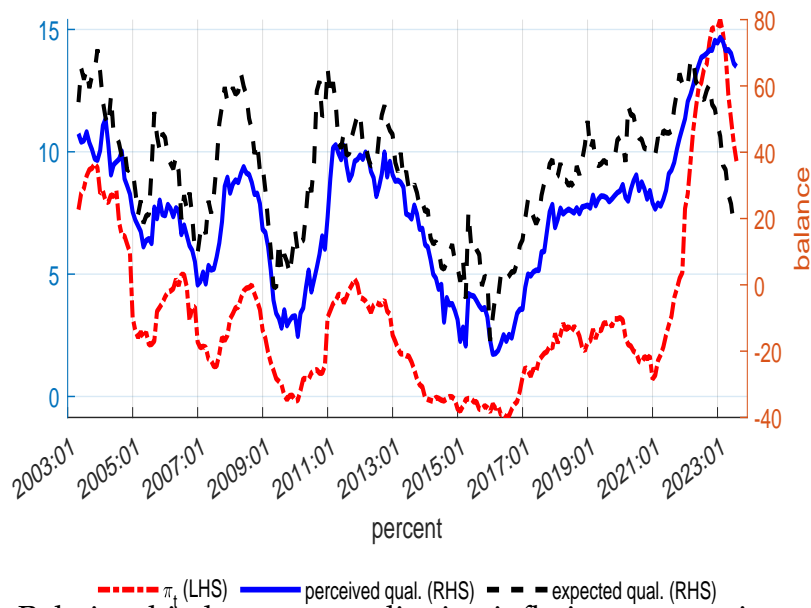
Figure 18: Relationship between qualitative inflation expectations and perceptions

Because the balances of qualitative perceptions and expectations are publicly available for all participating countries, we can assess how strongly perceptions and expectations move together across countries. Figure 19 shows the distribution of contemporaneous correlations between qualitative inflation perceptions and expectations across countries. This distribution is strikingly non-uniform. It is worth noting that Slovakia is not an outlier regarding a strong contemporaneous link between perceptions and expectations. On the other side of the distribution there are countries such as Italy, the Netherlands or Latvia with a very low contemporaneous correlation between perceptions and expectations. This result points to a significantly heterogeneous evidence across countries on the co-movement of inflation perceptions and expectations.
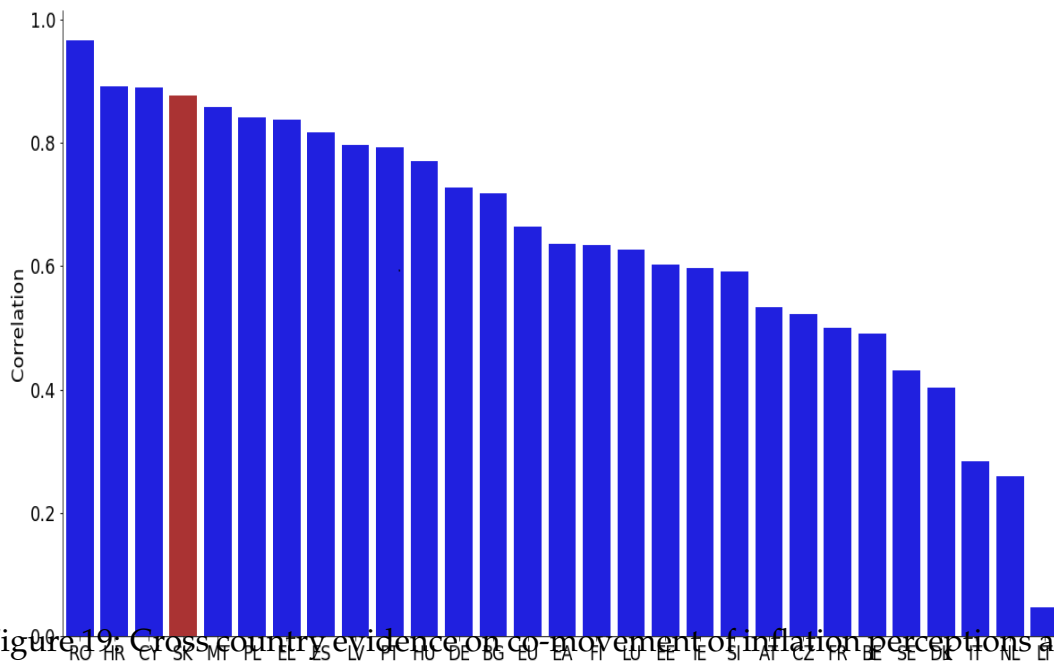
Figure 19: Cross country evidence on co-movement of inflation perceptions and expectation

## D.11. FURTHER TIME SERIES OBSERVATIONS REGARD-ING THE EXTENSIVE AND INTENSIVE MARGIN OF QUANTITATIVE INFLATION EXPECTATIONS

Figure 20 illustrates the co-movement of the intensive and extensive margin of inflation expectations with the de-meaned inflation.
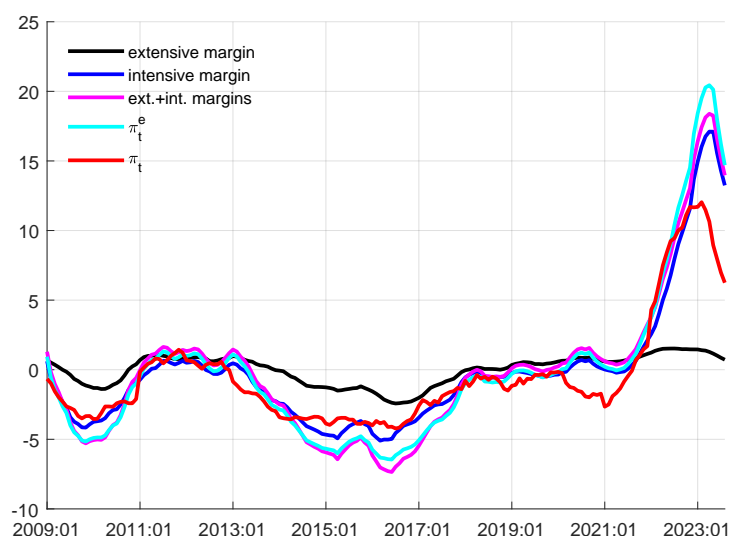


Figure 20: Intensive vs extensive margin of inflation expectations
Notes: De-meaned HICP inflation for Slovakia, y-o-y in %.

We can further observe that $fr_t^e = fr_t^{e+} + fr_t^{e-}$ where $fr_t^{e+}$ and $fr_t^{e-}$ denote the shares of respondents expecting positive and negative inflation, respectively. Similarly, in what follows, we denote by $dp_t^{e+}$ and $dp_t^{e-}$ the average size of positive and negative inflation expectations, respectively.
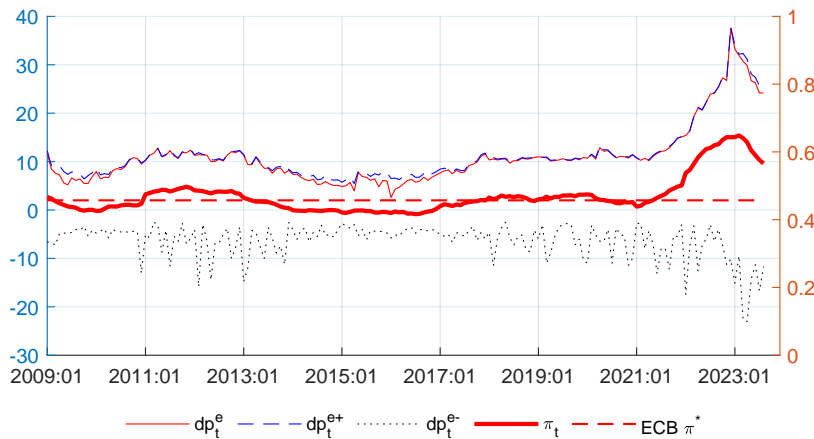
**Figure 21: Decomposition of the intensive margin of inflation expectations**

Notes: $dp_t^e$ = the average of expected inflation expectations, $dp_t^{e+}$ = magnitude of positive inflation expectations, $dp_t^{e-}$ = magnitude of negative inflation expectations.

Figure 21 and Figure 22 show the components of the intensive and extensive margins. As we can see, it is especially the magnitude of positive inflation expectations driving the intensive margin and for the extensive margin it is the combination of shares of people expecting positive and zero inflation which is driving the extensive margin.
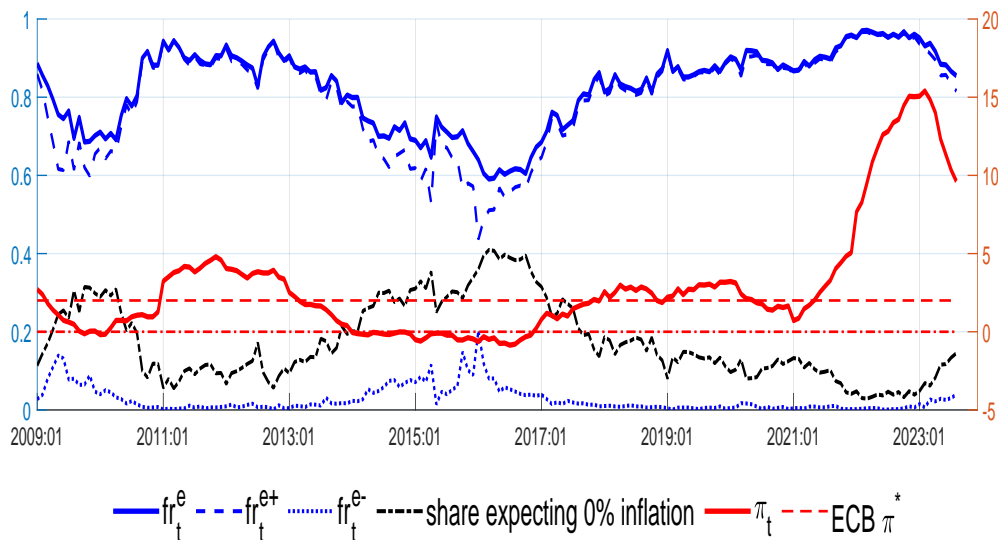


**Figure 22: Decomposition of the extensive margin of inflation expectations**

Notes: $fr_t^e$ = the fraction of consumers expecting non-zero inflation, $fr^{e+}$ = fraction of consumers expecting positive inflation, $fr^{e-}$ = fraction of items expecting negative inflation.

It is interesting to observe, Figure 23, that the share of people expecting negative inflation is virtually zero when the actual inflation is above 1%.
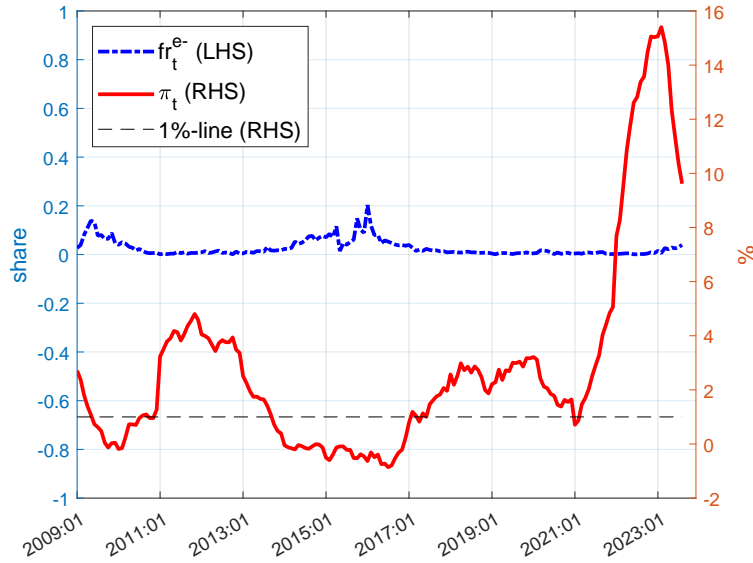
Figure 23: Share of consumers expecting negative inflation vs. inflation

For completeness, we also consider another decomposition proposed by Klenow and Kryvtsov (2008) which helps us to address the question whether fluctuations in expected inflations are the consequences of positive or negative inflation expectations. The expected inflation can be written as

$$\pi_t^e = fr_t^{e+}dp_t^{e+} - fr_t^{e-}dp_t^{e-}, \tag{8}$$

where $fr_t^+$ and $fr_t^-$ denote the fractions of price changes that are increases or decreases at time $t$, respectively, and $dp_t^{e+}$ and $dp_t^{e-}$ denote the average magnitudes of increases and decreases. With the help of equation (8), the variance of inflation expectations can be expressed in the following way

$$var(\pi_t^e) = \underbrace{var(fr_t^{e+}dp_t^{e+}) - cov(fr_t^{e+}dp_t^{e+}, fr_t^{e-}dp_t^{e-})}_{\text{POS term}}$$
$$+ \underbrace{var(fr_t^{e-}dp_t^{e-}) - cov(fr_t^{e+}dp_t^{e+}, fr_t^{e-}dp_t^{e-})}_{\text{NEG term}}. \tag{9}$$

As shown in Figure 24, the variance of inflation expectations is virtually completely dominated by changes in the level of the expected inflation increases.
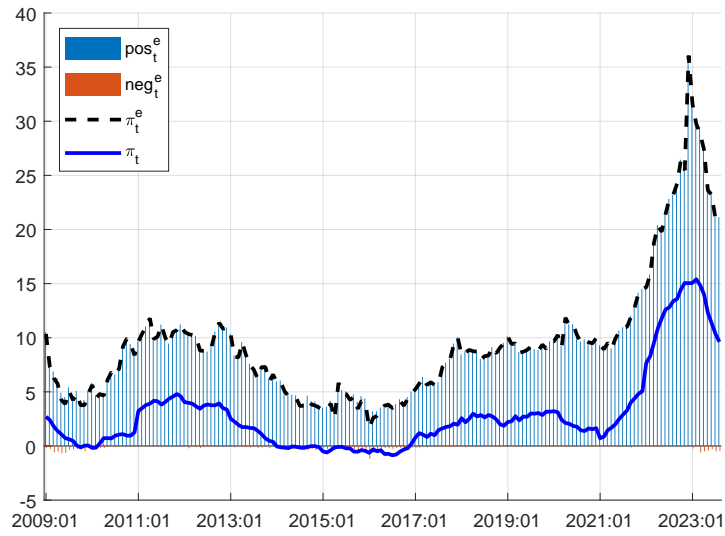
Figure 24: Decomposition of inflation into the terms associated with positive (POS) and negative (NEG) inflation expectations

## D.12. NEGATIVE ASSOCIATION OF INFLATION WITH ECONOMIC DEVELOPMENT

An important channel how perceiving and expecting higher inflation might affect households is their sentiment about how the inflation relates to the overall economic development. If households associate inflation with economically bad times, they might tend to lower their demand as well. In this vein Candia et al. (2020) provide compelling evidence of a negative association of inflation with economic growth by consumers and firms which is at odds with the evidence for professional forecasters.
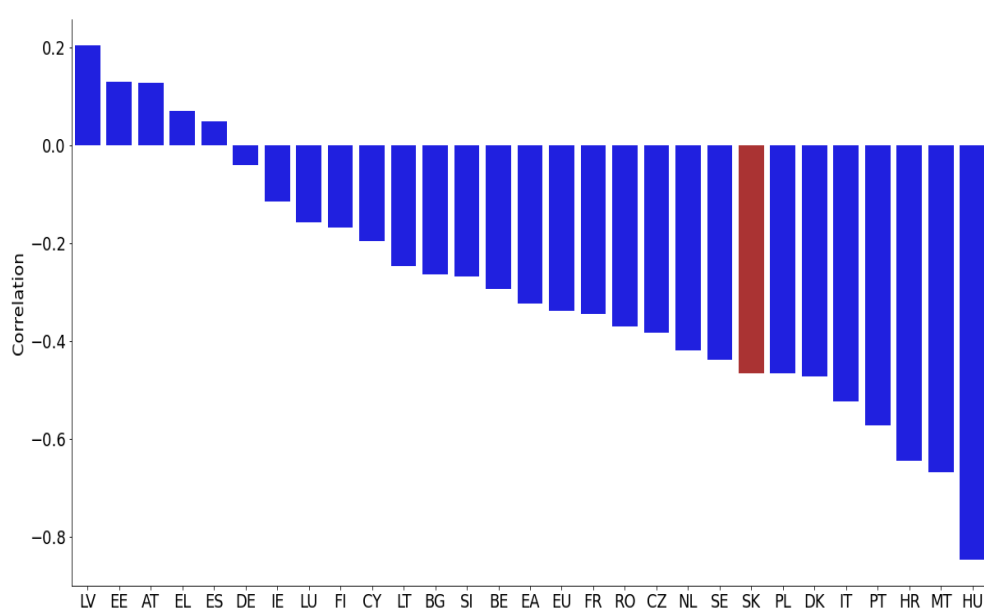


Figure 25: Cross-country evidence on the association of past inflation with past economic growth

Notes: EC consumer survey. Past economic development vs $\pi$ perception.

Using the qualitative perceptions and expectations about inflation and the overall economical environment across countries from the harmonized EC consumer survey we can derive a similar picture. Figure 25 shows the correlation between the question 5 (perceived inflation over the last 12 months) and the question 3 (perceived economic development of the country over the last 12 months) over the sample period between May 2003 and December 2022. Figure 25 shows the correlation between the question 6 (expected inflation over the next 12 months) and the question 4 (expected economic development of the country over the next 12 months). The message of both pictures is the same. Overall a negative association of inflation with positive economic development prevails which in line with the evidence of Candia et al. (2020) and Kamdar (2019) but the evidence across countries is heterogeneous.
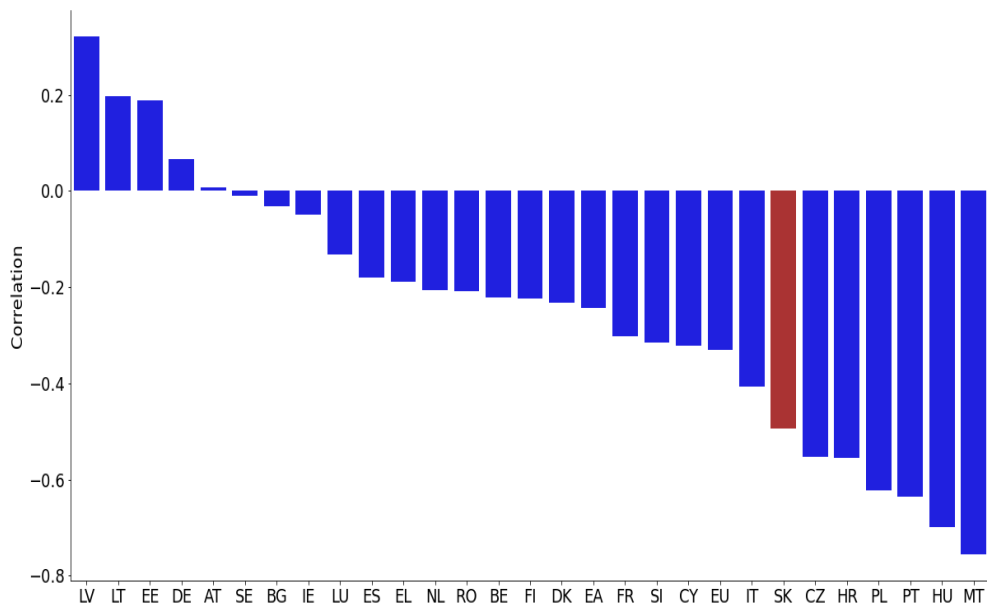
Figure 26: Cross-country evidence on the association of expected inflation with expected economic growth

Notes: EC consumer survey. Expected economic growth vs $\pi$ expectation.

Our sample of countries and the one in Candia et al. (2020) partly overlap. The following countries are in both samples: Germany, Italy, Spain, France and the Netherlands. Except for Germany where the correlation is slightly positive we find the same results as Candia et al. (2020). Given that they use another survey, the Consumer expectation survey of the ECB, our finding can be considered as an additional evidence from the EC consumer survey.

# D.13. ROBUSTNESS

## D.13.1 Controlling for the level of qualitative subjective inflation perceptions

|     |                      | whole sample | surge | defl. times | drop | remains |
|-----|----------------------|:------------:|:-----:|:-----------:|:----:|:-------:|
|     |                      | (1)          | (2)   | (3)         | (4)  | (5)     |
|     | average $\pi_t$      | 2.9%         | 9.1%  | -0.3%       | 12.3% | 2.1%   |
|     | readiness to spend   | 18.8%        | 14.5% | 21.0%       | 11.9% | 19.0%  |
|     | *Right time to purchase* | | | | | |
| (A) | higher inflation ($\pi^e_{DHW}$) | 0.033*** | 0.042*** | 0.013 | −0.008 | 0.035*** |
|     |                      | (0.003)      | (0.005) | (0.010)   | (0.011) | (0.004) |
| (B) | at least constant inflation | 0.011*** | 0.035*** | 0.019** | −0.015* | 0.008* |
|     |                      | (0.004)      | (0.007) | (0.007)   | (0.006) | (0.005) |
| (C) | $EM_{AGM}$           | 0.014***     | 0.019 | 0.024**     | 0.024 | 0.011** |
|     |                      | (0.004)      | (0.016) | (0.008)   | (0.021) | (0.005) |
| (D) | $IM_{AGM}$           | 0.000        | 0.001** | 0.001     | 0.001 | −0.000* |
|     |                      | (0.000)      | (0.000) | (0.001)   | (0.001) | (0.000) |
|     | *Controls*           | | | | | |
|     | Demographics         | X            | X     | X           | X    | X       |
|     | Expectations         | X            | X     | X           | X    | X       |
|     | $\pi_t$              | X            | X     | X           | X    | X       |
|     | $i_t$                | X            | X     | X           | X    | X       |
|     | No. obs.             | 119,387      | 11,322 | 23,877     | 3,185 | 81,003 |
|     | No. obs. IM          | 96,945       | 70,753 | 15,579     | 2,891 | 67,722 |

Standard errors, clustered at the quarter level, in parentheses.

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

### Table 10: Regression results of propensity to purchases durable goods

Notes: This table reports the estimated average marginal effects of a binomial logit regression evaluated at the sample mean. Households' readiness to spend on durables, modelled as a dummy variable equal to one if answering it is right time to purchase durables and zero otherwise, is the dependent variable. There are four measures of inflation expectations: (A) a dummy variable ($\pi^e_{DHW}$) that equals one if a household expects inflation to increase à la D'Acunto et al. (2022), (B) a dummy variable that equals one if a household expects inflation to be at least constant, (C) a dummy variable ($EM_{AGM}$) equal to one if a person expects positive inflation (extensive margin) and (D) the subjective level of expected inflation ($IM_{AGM}$ - intensive margin) à la Andrade et al. (2023). Only one inflation expectations measure is employed in a regression at a time. We control for household demographics and household expectations as well as the level of inflation and nominal interest rates. Yearly and monthly fixed effects are included. Demographics include: gender, age, income category per capita, education, employment status. Expectations include: own financial situation, economic growth in Slovakia, unemployment, financial status, considering given time as the right time to save, *qualitative* inflation perceptions. Time periods are as follows: (2) surge June 2021 - February 2023, (3) deflationary times January 2014 - December 2016, (4) drop March 2023 - August 2023, (5) remains are periods other than (2), (3) and (4).

## D.13.2 Controlling for the level of quantitative subjective inflation perceptions

|  | whole sample | surge | defl. times | drop | remains |
|---|---|---|---|---|---|
|  | (1) | (2) | (3) | (4) | (5) |
| average $\pi_t$ | 2.75% | 9.06% | -0.31% | 14.33% | 2.14% |
| readiness to spend | 17.4% | 12.8% | 20.2% | 11.4% | 17.6% |
| *Right time to purchase* | | | | | |
| $\pi^e_{DHW}$ | 0.029*** | 0.043*** | 0.006 | $-0.005$ | 0.032*** |
|  | (0.003) | (0.005) | (0.009) | (0.010) | (0.004) |
| at least constant | 0.001 | 0.036*** | 0.005 | $-0.013$** | 0.002 |
|  | (0.004) | (0.007) | (0.005) | (0.005) | (0.005) |
| $EM_{AGM}$ | $-0.003$ | 0.020 | 0.005 | 0.025 | 0.001 |
|  | (0.003) | (0.014) | (0.004) | (0.020) | (0.005) |
| $IM_{AGM}$ | 0.001*** | 0.002*** | 0.001 | 0.001 | 0.001*** |
|  | (0.000) | (0.001) | (0.001) | (0.001) | (0.000) |
| *Controls* | | | | | |
| Demographics | X | X | X | X | X |
| Expectations | X | X | X | X | X |
| $\pi_t$ | X | X | X | X | X |
| $i_t$ | X | X | X | X | X |
| No. obs. | 119,387 | 11,322 | 23,877 | 3,185 | 81,003 |
| No. obs. IM | 96,945 | 10,753 | 15,579 | 2,891 | 67,722 |

Standard errors, clustered at the quarter level, in parentheses.
Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 11: Regression results - robustness 1

Notes: This table reports the estimated average marginal effects of a binomial logit regression evaluated at the sample mean. Households' readiness to purchase durables is the dependent variable. There are three measures of inflation expectations: a dummy variable that equals one if a household expects inflation to increase à la D'Acunto et al. (2022), a dummy if a person expects positive inflation (extensive margin) and (3) the individual level of expected inflation (intensive margin) à la Andrade et al. (2023). Only one inflation expectations measure is employed in a regression at a time. We control for household demographics and household expectations as well as the level of inflation and nominal interest rates. Demographics include: gender, age, income category per capita, education, employment status. Expectations include: own financial situation, economic growth in Slovakia, unemployment, financial status, *quantitative* inflation expectations and considering given time as the right time to save. Time periods are as follows: (2) surge June 2021 - February 2023, (3) deflationary times January 2014 - December 2016, (4) drop March 2023 - August 2023, (5) remains are periods other than (2), (3) and (7). Standard errors, even though not reported explicitly, are clustered at the quarter level.

## D.13.3 Not controlling for any subjective inflation perceptions

| | whole sample | surge | defl. times | drop | remains |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| average $\pi_t$ | 2.75% | 9.06% | -0.31% | 14.33% | 2.14% |
| readiness to spend | 17.4% | 12.8% | 20.2% | 11.4% | 17.6% |
| | Right time to purchase | | | | |
| $\pi_{DHW}^e$ | 0.030*** | 0.042*** | 0.006 | −0.009 | 0.033*** |
| | (0.003) | (0.004) | (0.009) | (0.009) | (0.004) |
| at least constant | −0.001 | 0.033*** | −0.005 | −0.016*** | −0.001 |
| | (0.004) | (0.007) | (0.004) | (0.005) | (0.005) |
| $EM_{AGM}$ | −0.007* | 0.019 | −0.010*** | 0.023 | −0.006 |
| | (0.004) | (0.014) | (0.003) | (0.020) | (0.006) |
| $IM_{AGM}$ | −0.000 | 0.001*** | −0.002*** | 0.001 | −0.001*** |
| | (0.000) | (0.000) | (0.001) | (0.000) | (0.000) |
| | Controls | | | | |
| Demographics | X | X | X | X | X |
| Expectations | X | X | X | X | X |
| $\pi_t$ | X | X | X | X | X |
| $i_t$ | X | X | X | X | X |
| No. obs. | 119,387 | 11,322 | 23,877 | 3,185 | 81,003 |
| No. obs. IM | 96,945 | 10,753 | 15,579 | 2,891 | 67,722 |

Standard errors, clustered at the quarter level, in parentheses.
Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 12: Regression results - robustness 2

<u>Notes:</u> This table reports the estimated average marginal effects of a binomial logit regression evaluated at the sample mean. Households' readiness to purchase durables is the dependent variable. There are three measures of inflation expectations: a dummy variable that equals one if a household expects inflation to increase à la D'Acunto et al. (2022), a dummy if a person expects positive inflation (extensive margin) and (3) the individual level of expected inflation (intensive margin) à la Andrade et al. (2023). Only one inflation expectations measure is employed in a regression at a time. We control for household demographics and household expectations as well as the level of inflation and nominal interest rates. Demographics include: gender, age, income category per capita, education, employment status. Expectations include: own financial situation, economic growth in Slovakia, unemployment, financial status and considering given time as the right time to save. *There is no control for any inflation perceptions employed in the regression.* Time periods are as follows: (2) surge June 2021 - February 2023, (3) deflationary times January 2014 - December 2016, (4) drop March 2023 - August 2023, (5) remains are periods other than (2), (3) and (4). Standard errors, even though not reported explicitly, are clustered at the quarter level.

## D.13.4  Not controlling for the right time for saving

| | | whole sample | surge | defl. times | drop | remains |
|---|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) | (5) |
| | average $\pi_t$ | 2.9% | 9.1% | -0.3% | 12.3% | 2.1% |
| | readiness to spend | 18.8% | 14.5% | 21.0% | 11.9% | 19.0% |
| | | Right time to purchase | | | | |
| (A) | higher inflation ($\pi^e_{DHW}$) | 0.030*** | 0.041*** | 0.008 | 0.010 | 0.032*** |
| | | (0.003) | (0.005) | (0.010) | (0.011) | (0.004) |
| (B) | at least constant inflation | 0.010** | 0.034*** | 0.018*** | −0.018*** | 0.007 |
| | | (0.004) | (0.007) | (0.007) | (0.006) | (0.005) |
| (C) | $EM_{AGM}$ | 0.013*** | 0.021 | 0.024*** | 0.022 | 0.010* |
| | | (0.004) | (0.016) | (0.008) | (0.020) | (0.005) |
| (D) | $IM_{AGM}$ | 0.000 | 0.001*** | −0.001** | 0.001 | −0.000** |
| | | (0.000) | (0.000) | (0.001) | (0.001) | (0.000) |
| | | Controls | | | | |
| | Demographics | X | X | X | X | X |
| | Expectations | X | X | X | X | X |
| | $\pi_t$ | X | X | X | X | X |
| | $i_t$ | X | X | X | X | X |
| | No. obs. | 119,387 | 11,322 | 23,877 | 3,185 | 81,003 |
| | No. obs. IM | 96,945 | 10,753 | 15,579 | 2,891 | 67,722 |

Standard errors, clustered at the quarter level, in parentheses.
Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 13: Regression results of propensity to purchases durable goods

Notes: This table reports the estimated average marginal effects of a binomial logit regression evaluated at the sample mean. Households' readiness to spend on durables, modelled as a dummy variable equal to one if answering it is right time to purchase durables and zero otherwise, is the dependent variable. There are five measures of inflation expectations where the first three indicators are based on qualitative answers and the remaining two indicators are based on quantitative answers: (A) a dummy variable ($\pi^e_{DHW}$) that equals one if a household expects inflation to increase à la D'Acunto et al. (2022), (B) a dummy variable that equals one if a household expects inflation to be at least constant, (C) a dummy variable that equals one if a household expects positive inflation, (D) a dummy variable ($EM_{AGM}$) equal to one if a person expects quantitative positive inflation (extensive margin) and (E) the subjective level of expected inflation ($IM_{AGM}$ - intensive margin) à la Andrade et al. (2023). Only one inflation expectations measure is employed in a regression at a time. We control for household demographics and household expectations as well as the level of inflation and nominal interest rates. Yearly and monthly fixed effects are included. Demographics include: gender, age, income category per capita, education, employment status. Expectations include: own financial situation, economic growth in Slovakia, unemployment, financial status, qualitative inflation perceptions. *Considering given time as the right time to save is excluded as a control variable.* Time periods are as follows: (2) surge June 2021 - February 2023, (3) deflationary times January 2014 - December 2016, (4) drop March 2023 - August 2023, (5) remains are periods other than (2), (3) and (4).

### D.13.5 Adding control variables one by one

|  |  | whole sample |
|---|---|---|
|  | average $\pi_t$ | 2.9% |
|  | readiness to spend | 18.8% |
|  | Right time to purchase | |
|  | explanatory variable | coef. on $\pi_{DHW}^e$ |
| (1) | higher inflation ($\pi_{DHW}^e$) | $-0.010^{**}(0.000)$ |
| (2) | + nom. int. rate | $-0.009^{**}(0.000)$ |
| (3) | + actual inflation | $-0.001(0.004)$ |
| (4) | + qual. $\pi^p$ | $0.013^{***}(0.017)$ |
| (5) | + finan. status | $0.018^{***}(0.055)$ |
| (6) | + past ind. fin. sit. | $0.020^{***}(0.064)$ |
| (7) | + saving good time | $0.025^{***}(0.078)$ |
| (8) | + exp. ind. fin. sit. | $0.029^{***}(0.082)$ |
| (9) | + exp. GDP growth | $0.034^{***}(0.086)$ |
| (10) | + exp. unemployment | $0.037^{***}(0.088)$ |
| (11) | + gender | $0.037^{***}(0.089)$ |
| (12) | + income cat. | $0.036^{***}(0.091)$ |
| (13) | + education | $0.036^{***}(0.091)$ |
| (14) | + employ. status | $0.036^{***}(0.091)$ |
| (15) | + age | $0.036^{***}(0.095)$ |
| (16) | + year dummy | $0.033^{***}(0.097)$ |
| (17) | + monthly dummy | $0.033^{***}(0.097)$ |
|  | No. obs. | 119,387 |

McFadden's Pseudo-$R^2$ in parentheses.
Significance levels: $^{***}$ $p < 0.01$, $^{**}$ $p < 0.05$, $^{*}$ $p < 0.1$.

Table 14: Regression results of propensity to purchases durable goods if adding explanatory variables one by one

## D.14. Socio-demographic differences between the pool of people expecting higher inflation and the pool of people with no inflation expectations

In the following we report the statistics for comparative purpose while focusing on the surge period, 2021:06-2023:3, as for this period the differences in the impact of expecting higher inflation or lacking inflation expectations lead to the largest discrepancies in terms of consumption.

|  |  | higher inflation | don't know |
|---|---|---|---|
| no. obs. |  | 5,757 | 580 |
| share |  | 48.4% | 4.9% |
| readiness to buy durables (Q8) |  | 15.6% | 7.9% |
| *Household demographics* |  |  |  |
| gender | male | 53.4% | 52.6% |
|  | female | 46.6% | 47.4% |
| age | 16-29 | 18.0% | 18.4% |
|  | 30-49 | 40.0% | 37.8% |
|  | 50-64 | 27.2% | 28.6% |
|  | 65+ | 14.9% | 15.2% |
| education | primary | 12.8% | 13.6% |
|  | secondary | 67.7% | 69.3% |
|  | further | 19.4% | 17.1% |
| income category | 1st (lowest) quartile | 9.3% | 6.7% |
|  | 2nd quartile | 26.4% | 20.2% |
|  | 3rd quartile | 27.7% | 30.0% |
|  | 4th quartile | 36.6% | 43.1% |
| employment status | active | 61.6% | 56.0% |
|  | not active | 38.4% | 44.0% |
| *Household expectations and perceptions* |  |  |  |
| current financial situation | save a lot | 3.9% | 5.7% |
|  | save little | 49.3% | 42.1% |
|  | don't save | 33.9% | 39.3% |
|  | dissave | 6.6% | 6.0% |
|  | take on debt | 6.3% | 6.9% |
| financial outlook | improves substantially | 0.5% | 1.2% |
|  | improves somewhat | 7.7% | 5.9% |
|  | identical | 57.0% | 65.3% |
|  | worsens somewhat | 24.7% | 18.4% |
|  | worsens substantially | 10.1% | 9.1% |
| savings good times | yes | 26.1 | 21.6% |
| economic outlook | improves substantially | 0.6% | 0.7% |
|  | improves somewhat | 5.0% | 6.6% |
|  | identical | 18.2% | 23.4% |
|  | worsens somewhat | 37.9% | 40.7% |
|  | worsens a lot | 38.3% | 28.6% |
| expected unemployment rate | increases substantially | 21.1% | 16.4% |
|  | increases somewhat | 40.0% | 36.7% |
|  | identical | 27.6% | 36.6% |
|  | decreases somewhat | 10.5% | 9.1% |
|  | decreases a lot | 0.7% | 1.2% |

Table 15: Descriptive statistics between informed and not informed consumers

# E. AVERAGE MARGINAL EFFECTS

In the main text we reported marginal effects where all other variables except for the measure of inflation expectation were kept at its sample mean. This approach is sometimes criticized as it implies, particularly for categorical variable as gender, that there might not exist a representative individual of that kind. For robustness, we therefore also report the average marginal effects which, in

essence, are identical or even slightly larger.

| | | whole sample | surge | defl. times | drop | remains |
|---|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) | (5) |
| | average $\pi_t$ | 2.9% | 9.1% | -0.3% | 12.3% | 2.1% |
| | readiness to spend | 18.8% | 14.5% | 21.0% | 11.9% | 19.0% |
| | | Right time to purchase | | | | |
| (A) | higher inflation ($\pi^e_{DHW}$) | 0.033*** | 0.045*** | 0.013 | −0.009 | 0.036*** |
| | | (0.003) | (0.005) | (0.010) | (0.012) | (0.004) |
| (B) | at least constant inflation | 0.011*** | 0.038*** | 0.019*** | −0.016** | 0.009* |
| | | (0.004) | (0.008) | (0.006) | (0.007) | (0.005) |
| (C) | $EM_{AGM}$ | 0.015*** | 0.020 | 0.024*** | 0.026 | 0.012** |
| | | (0.004) | (0.018) | (0.008) | (0.023) | (0.005) |
| (D) | $IM_{AGM}$ | 0.002*** | 0.002*** | 0.001 | 0.001 | 0.001*** |
| | | (0.000) | (0.001) | (0.001) | (0.001) | (0.000) |
| | | Controls | | | | |
| | Demographics | X | X | X | X | X |
| | Expectations | X | X | X | X | X |
| | $\pi_t$ | X | X | X | X | X |
| | $i_t$ | X | X | X | X | X |
| | No. obs. | 119,387 | 11,322 | 23,877 | 3,185 | 81,003 |
| | No. obs. IM | 96,945 | 10,753 | 15,579 | 2,891 | 67,722 |

Standard errors, clustered at the quarter level, in parentheses.
Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 16: Regression results of propensity to purchases durable goods - average marginal effects

Notes: **This table reports the estimated average marginal effects from a binomial logit regression.** Households' readiness to spend on durables, modelled as a dummy variable equal to one if answering it is right time to purchase durables and zero otherwise, is the dependent variable. There are four measures of inflation expectations: (A) a dummy variable ($\pi^e_{DHW}$) that equals one if a household expects inflation to increase à la D'Acunto et al. (2022), (B) a dummy variable that equals one if a household expects inflation to be at least constant, (C) a dummy variable ($EM_{AGM}$) equal to one if a person expects positive inflation (extensive margin) and (D) the subjective level of expected inflation ($IM_{AGM}$ - intensive margin) à la Andrade et al. (2023). Only one inflation expectations measure is employed in a regression at a time. We control for household demographics and household expectations as well as the level of inflation and nominal interest rates. Yearly and monthly fixed effects are included. Demographics include: gender, age, income category per capita, education, employment status. Expectations include: own financial situation, economic growth in Slovakia, unemployment, financial status and considering given time as the right time to save. As in the main regressions, shown in Table 10, we control for the quantitative perceived inflation in the regressions that use the quantitative inflation expectation questions and control for the qualitative inflation perception in the regressions using the qualitative inflation expectation measures. Time periods are as follows: (2) surge June 2021 - February 2023, (3) deflationary times January 2014 - December 2016, (4) drop March 2023 - August 2023, (5) remains are periods other than (2), (3) and (4).