Pass-through and bias in South Africa's household inflation expectations

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ERSA working paper 935

August 2026

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07 August 2026

Abstract

This paper uses data from Statistics South Africa's Income and Expenditure Survey (IES) and the Bureau for Economic Research's (BER) Household Inflation Expectations Survey to assess whether inflation expectations among South African households are proportionally responsive to the income allocated to different expenditure categories. The aim is to determine whether pass-through is biased relative to the basket of goods that income groups spend on. We also examine how inflation expectations react to increasing versus stable inflation, shedding light on potential nonlinearities in the pass-through of changes in salient categories of inflation onto expectations. Our findings provide further evidence that inflation expectations are systematically biased relative to the typical expenditure basket of their income percentile. We find that food inflation for high-income households exhibits a pass-through effect that exceeds their food expenditure share, suggesting an overweighting of food price changes when forming their expectations. The pass-through of housing and utilities prices is consistently lower than expenditure shares across all income groups. Hence, there is evidence that household expectations over- or underreact to salient prices in their consumption baskets. Many, but not all, of our results are compatible with the international evidence. This may be because our dataset is both more granular and spans a longer period than those of many other studies.

Keywords: inflation, inflation expectations, pass-through

JEL Codes: E31, E71, E58

1. Introduction

Traditional economic models assume that households' inflation expectations are formed rationally, with agents efficiently processing all available information. This is the foundation of the full information rational expectations (FIRE) hypothesis (Mallard, 2012). Under this framework, individuals are assumed to possess complete knowledge of economic dynamics and to forecast inflation without systematic errors. However, international and domestic empirical evidence consistently contradicts this assumption, showing that expectations may deviate from FIRE in predictable ways (Branch, 2004; Crowther-Ehlers, 2019; Malmendier and Nagel, 2016). Hence, expectations are biased. This finding has spurred contributors to the literature to improve our understanding of the bias in inflation expectations phenomenon.

One typical deviation is a systematic upward bias in inflation expectations. Households tend to overestimate future inflation (Weber et al., 2022). Another is that inflation expectation errors tend to exhibit serial correlation, meaning they are not merely random fluctuations, but follow identifiable patterns (Coibion and Gorodnichenko, 2015*a*). These findings suggest that households do not optimize over all available economic information.[1]

One theory used to explain this bias is that decision-makers instead rely on a narrower, individually relevant subset of publicly available information (Curtin, 2019). This concept posits that consumers[2] process information efficiently, but that this information set is gathered from their own experiences, such as their expenditure bundles, leading to the significant heterogeneity in expectations we observe (Blanchflower and MacCoille, 2009; Crowther-Ehlers, 2019; Weber et al., 2022). Stated differently, while each consumer may use information efficiently, the information set varies significantly according to their individual expenditure patterns. In other words, their individual expenditure patterns constitute the information set, rather than the aggregate inflation numbers typically used to measure forecast errors.

If households behaved optimally relative to their expenditure bundles, we would expect the sensitivity of their inflation expectations to be directly proportional to the impact of price changes on their individual expenditure baskets. However, research outside South Africa shows that households do not behave optimally in this sense and that inflation expectations often react disproportionately to price changes in salient items (Binder, 2018; Georganas et al., 2014; Murphy and Rohde, 2018). Systematic biases[3] in inflation expectations emerge when households either over- or underweight specific prices relative to their actual expenditure shares.

Testing for the presence of this bias[4] has not been done in the South African household data. There is some evidence that South African households rely on perceptions of past headline inflation when forming expectations (Bosch et al., 2017), but this study addresses a gap in the South African literature by examining whether households form their inflation expectations based on the actual impact of price changes reflective of their specific consumption baskets – that is, their lived experience of inflation.

[1] Bias is typically determined relative to CPI (average headline inflation), and aggregate inflation numbers are typically used to measure forecast errors used to determine rationality of expectations. We use a different information set against which to judge bias.

[2] Consumers may include individual or household respondents.

[3] Systematic biases suggest non-optimal use of information.

[4] This bias is defined as deviations from optimal use of the information set, where the info set in your case is their own expenditure basket and not aggregate CPI.

Drawing on data from Statistics South Africa's Income and Expenditure Survey (IES), we analyse how spending patterns differ across household income groups. We then test whether the sensitivity of their inflation expectations (i.e., the pass-through from price changes to the inflation expectations of these income groups) accurately reflects their expenditure shares, or whether systematic biases distort this relationship. The data allow us to test this type of bias at the aggregate level, across a selection of quarters, and by income group.

International evidence points to households often over- or underreacting relative to a given item's weight in their expenditure basket, showing heightened sensitivity instead to the prices of particularly salient goods[5] The degree of salience is generally linked to factors such as purchase frequency, price volatility, and the size of price changes (Bruine De Bruin et al., 2011; Georganas et al., 2014). Evidence from the United States shows that inflation expectations are particularly influenced by the prices of frequently purchased goods such as food and fuel (Clark and Davig, 2008; Harris et al., 2009; Wong, 2015).

Saliency may also be driven by large changes or heightened price volatility. Psychological research indicates that larger price changes are more salient than smaller ones, and price increases are more noticeable than price decreases (Tversky and Kahneman, 1974). Consistent with this, Bruine De Bruin et al. (2011) show that when survey respondents were asked to recall a price change, they tended to remember goods and services with more extreme fluctuations, leading to more dispersed and extreme inflation expectations. This salience bias may also help explain gender differences in inflation expectations, where women, who are more likely to be primary grocery shoppers, tend to report systematically higher inflation expectations (D'Acunto, Malmendier, Ospina and Weber, 2021; Jonung, 1981).

In our case, we do not have access to granular data on the frequency of purchases for South African households. Instead, we test whether households are particularly sensitive to prices that constitute the largest shares of their expenditure baskets. Depending on the magnitude and direction of the estimated effects, we attribute any observed bias to salience, whether arising from price volatility or from the size of price changes.

An additional dimension we explore is the role of the inflation environment in the formation of expectations. We empirically investigate whether the pass-through differs between low- and high-inflation environments. While we do not explicitly test for changes in attentiveness, if inflation expectations are more responsive (i.e., the pass-through is higher) under a high inflation regime, this would align with the idea that the public is more attentive to inflation when it is at a high level (Foresto et al., 2025).

Evidence from other countries suggests that people are relatively inattentive in low inflation settings, as the perceived cost of being uninformed is lower (Cavallo et al., 2017). In contrast, periods of high inflation tend to increase the likelihood of bias and risk of de-anchoring (Huber et al., 2023). In the South African context, Bosch et al. (2015) found that households' inflation expectations tended to be more anchored when inflation was low. However, the nonlinearity in pass-through effects has not been examined using more recent household inflation expectations. By dividing our sample into periods of

[5]Saliency refers to the cognitive tendency of consumers to place disproportionate emphasis on the most easily recalled information.

rising and stable inflation, we investigate whether the inflation environment influences the strength of households' price response. This is another contribution we aim to make with this paper.

Our findings confirm the presence of systematic biases, with households displaying varying sensitivities to price changes that do not always align with actual expenditure shares. We find that high-income households exhibit a pass-through effect that exceeds their food expenditure share, suggesting an overweighting of food price changes in their expectations. In contrast, low-income households show a weaker pass-through effect than their food expenditure share would suggest, implying an underweighting of food prices when forming expectations.

For housing and utilities inflation, pass-through coefficients are consistently lower than expenditure shares across all income groups, suggesting that households are less sensitive to fluctuations in housing costs. This is possibly because housing costs, such as rent, are paid less frequently and are relatively stable over a quarterly period, making them less salient. In the case of utilities, these costs are not easily substitutable, which means there is no incentive to consider alternatives, thereby making these costs perhaps less salient. Additionally, our analysis highlights the potential nonlinearity in pass-through effects, particularly for food and housing inflation.

The remainder of this paper is structured as follows: Section 2 reviews the literature; Section 3 describes the data; Section 4 outlines the empirical methodology and presents key findings in household inflation expectations. The paper concludes with a discussion of policy implications in Section 5.

2. Bias in household inflation expectations: theory and facts

Unlike what the FIRE assumption would predict (Coibion et al., 2018; Mallard, 2012), inflation expectations data have been found to be systematically biased (Branch, 2004). In particular, household inflation expectations are often biased relative to those of financial analysts and to observed headline CPI inflation. This phenomenon has been documented across advanced and emerging economies – including that of South Africa per Crowther-Ehlers (2019) – across various periods and with diverse survey methodologies (Bryan and Venkatu, 2001; Candia et al., 2021)).

This bias is even more noticeable when some socioeconomic characteristics are considered. For example, women tend to have higher inflation expectations than men (Bruine de Bruin et al., 2010; D'Acunto, Malmendier and Weber, 2021), and lower-income individuals also exhibit a higher upward bias relative to other income groups (Weber et al., 2022), while individuals with higher cognitive abilities tend to have a lower degree of upward bias (D'Acunto et al., 2019). These biases in expectation formation have led to predictable patterns in the data that are inconsistent with the rational expectations assumption (Coibion and Gorodnichenko, 2015*b*; Lein and Maag, 2011).

In South Africa, there is also evidence that inflation expectations data exhibit these biases. Ehlers and Steinbach (2007), for example, find that the inflation expectations of financial analysts, firms, and trade unions fail to be formed rationally, and tend to overestimate future inflation. Similarly, Kabundi et al. (2015) show that the inflation expectations of firms and trade unions are largely backwards-looking and reactive to past inflation – all of which indicate that information was not used efficiently. Reid

and Siklos (2023) further find that neither financial analysts nor firms' expectations are rational in the strict sense, as both exhibit strong biases in their forecast errors. Household inflation expectations also display significant bias[6], with Reid, Siklos and Plessis (2021) finding that these biases are particularly pronounced among women, older individuals, lower-income individuals, and those with fewer years of education.

Researchers have increasingly explored alternative theoretical frameworks for modelling or explaining inflation expectations. Branch (2004), for instance, relaxes the traditional full-information rational expectations (FIRE) assumption by introducing heterogeneous agents, each optimizing within the bounds of their own information sets and constraints. Building on this perspective, Curtin (2019) contends that expectations may still be considered rational, but only when contextualized within each person's experiences and choice sets – rather than in an aggregate, model-consistent sense.

This shift in thinking underscores the subjective nature of expectation formation and the importance of context when studying expectations. Weber et al. (2022) proposes the concept of subjective inflation expectations, referring to belief-based anticipations of future inflation elicited from non-financial agents. These expectations reflect individual information sets – and, in the case of subjective expectations, perhaps the imperfect use of them – rather than aggregate economic data, such as headline CPI inflation. Beginning with the fact that information sets vary significantly across individuals and households, this results in substantial heterogeneity in inflation expectations and explains the persistent deviations from FIRE (Mankiw et al., 2003).

Curtin (2019) postulates that individuals form expectations based on their own information sets rather than official inflation statistics or aggregate economic indicators. In this paper, we use household expenditure on specific goods and services as the relevant benchmark. If expectations are rational, as Curtin (2019) suggests, households should respond proportionately to price changes relating to the expenditure share of the affected good or service. Alternatively, household inflation expectations may over- or underreact to price changes relative to the good's weight in their expenditure basket. Put differently, a respondent who uses available information about their own expenditure would adjust their inflation expectations in a way that reflects the relative impact of price changes on their total spending.

Household inflation expectations may also exhibit systematic biases, even when viewed through the lens of individual information sets – expenditure baskets. In such cases, individuals may react inefficiently to available information—overreacting or underreacting to price changes relative to the item's weight in their expenditure basket. Consumers are not using information efficiently if their response to a price change is disproportionate to how much they spend on that item. For example, if an item constitutes 5% of a household's consumption basket, we would expect the corresponding adjustment in inflation expectations to be proportionate. Deviations from this – whether an exaggerated or muted response – suggest an over- or underreaction to price movements (bias or inefficient use of the information set).

Observed biases in the formation of household inflation expectations can arise for several reasons. A well-documented explanation of biases in the behaviour of households' inflation expectations[7] is salience.

[6]There are surveys of other groups, but you will be focusing in this paper on the household survey.
[7]We use the term 'households' throughout, though this may include individual- or consumer-level studies as well.

D'Acunto, Malmendier, Ospina and Weber (2021) report that when individuals in the U.S. rank the information sources they rely on to form inflation expectations, their own shopping experiences are often most salient. Specific features that make this more salient include both the frequency with which households do grocery shopping, plus the characteristic volatility of many of these prices. Since observed price signals vary depending on an individual's shopping basket and supermarket choice, inflation expectations also differ across individuals within a household.[8]

Georganas et al. (2014) specifically examine the frequency bias that arises because survey respondents' attention, when asked about inflation, is drawn to price changes of frequently purchased items rather than those of a representative expenditure bundle. The more frequently an individual is exposed to an item's price, the more memorable it becomes (Bruine De Bruin et al., 2011). This phenomenon is closely related to the availability bias described by Tversky and Kahneman (1974), which suggests that individuals assess the likelihood of an event occurring based on how easily they can recall a similar event. When eliciting inflation expectations, consumers may overestimate the importance of prices they frequently see, leading to systematic biases in their responses.

One explanation for this finding stems from the observation that women tend to have higher inflation expectations than men (Jonung, 1981). This difference arises because, in many households, women are the primary grocery shoppers and are more exposed to food prices (D'Acunto, Malmendier and Weber, 2021). However, when controlling for the household's primary grocery shopper, D'Acunto, Malmendier and Weber (2021) find that the gender disparity in inflation expectations disappears. In households where men are the primary grocery shoppers, their inflation expectations are similarly elevated.

Salience is another source of bias. Psychological research indicates that larger price changes are more salient than smaller ones, and price increases are more noticeable than price decreases (Tversky and Kahneman, 1974). Consistent with this, Bruine De Bruin et al. (2011) show that when survey respondents were asked to recall a price change, they tended to recall goods and services with more extreme fluctuations, leading to more dispersed and extreme inflation expectations. An implication from evidence on U.S. consumers is that they tend to overweight these prices relative to their actual expenditure share in the consumption basket (Binder, 2018), and thus react in a biased way.

Similarly, some of the literature suggests it is unsurprising that food and fuel price inflation are particularly salient when households form their inflation expectations. However, the results for how sensitive inflation expectations are to these prices are mixed. Several studies have indicated that it is often the non-core (both food and energy prices) part of inflation that disproportionately affects headline expected inflation in the U.S. (Trehan, 2011; Dietrich, 2024). Murphy and Rohde (2018) find a slightly different result, also for the U.S., showing that food inflation is weighted more heavily and energy price inflation less heavily relative to the expenditure shares of these items implied by the CPI. Their findings are further supported by Aidala et al. (2024), who find that U.S. household inflation expectations are less sensitive to gasoline price shocks than to food price shocks. They also show that, while positive gasoline price shocks significantly impact inflation expectations, negative shocks have little to no effect.

[8]We do not have access to information about individuals within a household, but we can compare households by income group, and control for the gender and race of the survey respondent.

In fact, the sensitivity of inflation expectations to negative gasoline price shocks is considerably lower than gasoline's expenditure share in household budgets.[9]

In Japan, Kikuchi and Nakazono (2023) find that consumers' inflation forecast revisions are highly sensitive to food prices, with individuals who purchase food more frequently displaying even greater sensitivity. Similarly, Singh and Bandyopadhyay (2024) show that household inflation expectations in India react much more to the day-to-day purchases of food and fuel than to macroeconomic variables such as the aggregate inflation rate or inflation volatility. In the emerging market context, Cacnio and Basilio (2022) find that Philippine households closely monitor the price movements of specific commodities – namely food, petrol, utilities, transport, and alcoholic beverages – when forming inflation expectations, while paying less attention to housing and clothing, i.e., core prices.

Asymmetric responses to price shocks are also common. For example, a country's status as a net oil importer or producer may influence how energy prices affect inflation expectations. Nasir et al. (2020) examines the pass-through of positive and negative oil price shocks on inflation expectations in three Scandinavian countries and finds asymmetric and heterogeneous effects. Positive oil price shocks raise inflation expectations in Denmark, Norway, and Sweden, whereas negative shocks raise them in Denmark and Sweden (both net oil importers) but lower them in Norway (a net oil producer). Along similar lines, Istiak and Alam (2019) find that positive oil price shocks have a stronger effect on consumer inflation expectations than negative shocks in the U.S. This is further supported by Elliott et al. (2015), who show that oil price shocks have a persistent effect on market-based inflation expectations.

The price changes that come to mind when forming inflation expectations may depend on the prevailing inflation environment. Huber et al. (2023) finds that the prevailing inflation environment – whether high or low – poses a risk of de-anchoring inflation expectations if it becomes deeply embedded in individuals' beliefs about future inflation. It may be that during periods of relatively high inflation, individual goods and services tend to experience more extreme price fluctuations, which can bias inflation expectations upwardly (Bryan and Venkatu, 2001). Indeed, numerous studies have shown that survey respondents are highly influenced by the economic conditions in which they live (Coibion and Gorodnichenko, 2012). This aligns with research by Cavallo et al. (2017) and Patzelt and Reis (2024), who find that individuals exhibit greater awareness of inflation in high inflation environments. They posit that rational inattention[10] is lower when inflation is high, as the cost of misperceiving inflation is higher. In the South African context, Bosch et al. (2017) provide strong evidence that, at least during the 2008 to 2010 period, inflation perceptions[11] were closely tied to the existing inflation environment, and this may extend to inflation expectations too. Foresto et al. (2025) also finds that South African agents are attentive to inflation once it has passed a certain threshold, and that beyond this threshold, inflation expectations are slow to fall.

[9] Dhamija et al. (2025) shows that house prices in the US, due to their salience in the media and often being the largest asset in households' portfolios, contribute between 25-45% to overall inflation expectations, significantly above the weight of house prices in the overall consumption basket.

[10] Rational inattention refers to the idea that individuals and firms face information processing costs, so they optimally choose what and how much information to pay attention to. Rather than being fully informed, agents selectively acquire and process information based on its perceived value and cost.

[11] Inflation perceptions are what respondents believe inflation was over the last 12 months.

3. Preliminary data analysis

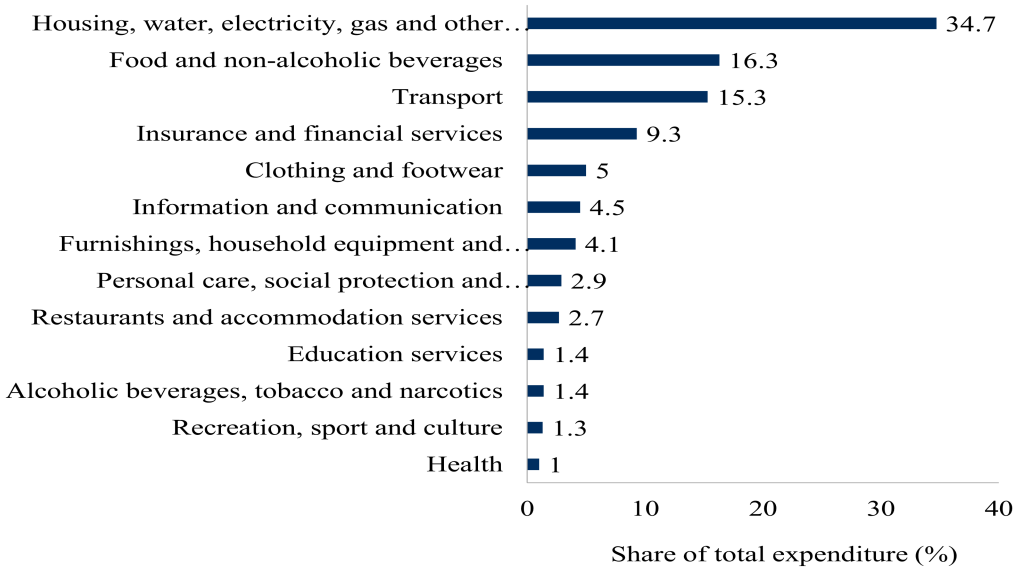
This paper draws on three main sources: the Income and Expenditure Survey (IES) from Stats SA, household inflation expectations data from the Bureau for Economic Research (BER), and price data from Stats SA.

3.1. Income and expenditure survey

We first use Stats SA's 2022/2023 Income and Expenditure Survey (IES) to identify which broad categories of goods households spend the most of their income on. The survey we used was conducted from November 2022 to November 2023, and the results were published in early 2025. The expenditure categories are very slow-moving variables, so the IES data is a fair representation of the shares used as benchmarks in the statistical analysis to follow.

Figure 1 reveals that the top three expenditure categories are *housing, water, electricity, gas and other fuels* (*housing and utilities* henceforth) – comprising 4.7%; *food and non-alcoholic beverages* – comprising 16.3%; and *transport* – comprising 15.3% – of total expenditure overall, for households on aggregate.

Figure 1: *Average annual household share of spending by expenditure division*



Source: Stats SA's Income and Expenditure Survey 2022/2023

Rather than focusing solely on average household spending by expenditure category, we also examine expenditure categories by income group, because differences in economic means across these groups may lead to sizeable differences in their expenditure patterns. While the IES reports ten income groups, we average them to align with the four household income groups in the BER's inflation expectations data: low, low-mid, high-mid, and high-income. Table 1 presents category expenditures for the top three categories by income group. The top three categories are the same for all income groups. Further on,

these relative weights will be compared with pass-through coefficients, offering insights into potential biases in household inflation expectations.

Table 1 shows that the *housing and utilities* category is the largest across all four income groups. The subcategories under housing are actual rent, imputed rent, water and electricity prices, which are typically adjusted once a year by the administrator or when the SARB adjusts the repurchase (repo) rate, and mortgage rates, which are also affected. In this case, infrequent price adjustments might reduce their salience. However, it is reasonable to suggest that the large and very public nature of electricity price increases in South Africa could, for example, increase the salience of this component.

Table 1: *Top three divisions by household consumption expenditure according to IES 2022/2023*

	Low income	**Low-mid income**	**High-mid income**	**High income**	**Overall weight in CPI**
Housing and utilities	36.7	36.0	34.4	33.3	34.7
Food and non-alcoholic beverages	30.0	24.3	14.9	8.4	16.3
Transport	7.9	10.6	17.0	19.2	15.3

Source: Stats SA's Income and Expenditure Survey 2022/2023 and authors own calculations. See more details in Table A1 in Appendix A

Food and non-alcoholic beverages is the second-largest category, with significant variation across income groups. It ranges from 30.0% for the low-income group to 8.4% for the high-income group. This category can be divided into two main subcomponents, with food comprising the largest share of the overall weight in this division – contributing 15.1%-points of the overall 16.3% weight – and non-alcoholic beverages comprising a less significant portion – 1.2% of the overall 16.3% weight; for more detail, see Table A1. These prices tend to be more volatile and are typically purchased more frequently, both of which are likely to increase salience.

Transport is the third-largest expenditure category, with households spending between 7.9% and 19.2% of their incomes on this category. The two lower-income groups spend a greater share of their income on passenger transport services (road, passenger rail, etc.). In comparison, the two higher-income groups spend a greater share of their income on purchasing vehicles, vehicle parts and fuel. Note that fuel prices (petrol and diesel) are directly captured in this category, while the cost of Brent Crude Oil (international oil price) is only indirectly captured through its influence on domestic fuel prices. Some transport subcategories are purchased infrequently and exhibit lower volatility, while others, such as fuel, are purchased more regularly and undergo frequent price changes (see Table A1 for more details). Hence, these features, which tend to affect salience, are likely to have a mixed effect on the category as a whole.

3.2. Household inflation expectations

The second dataset used in this paper is from the BER survey of household inflation expectations. The BER survey data is used as a measure of inflation expectations in the analysis. The BER offers microdata for four social groups (analysts, firms, trade unions and households). In this paper, the focus

Table 2: *One-year ahead inflation expectations of households, and observed CPI headline inflation*

	Mean	St. deviation	# Obs	% Share
Inflation expectations* <20	6.11	2.84	20820	
Male	6.18	2.84	9035	43.4
Female	6.05	2.84	11785	56.6
Low Income	6.32	2.76	5211	25
Low-Mid Income	5.96	2.84	5264	25.3
High-Mid Income	6.09	2.86	4997	24
High Income	6.07	2.88	5348	25.7
Black/African	5.87	2.80	13106	62.9
Coloured	6.29	2.76	2394	11.5
Indian	6.68	2.96	1232	5.9
White	6.60	2.87	4088	19.6
15-24	5.98	2.83	4292	20.6
25-34	5.79	2.77	6086	29.2
35-49	6.07	2.80	6069	29.1
50+	6.72	2.91	4373	21
Inflation expectations during 2014-2019**	6.18	2.52	11530	37.8
Inflation expectations during 2020-2024***	5.26	2.84	4464	14.6
CPI headline inflation 2003Q1-2024Q3	5.07	2.4	87	

*Source: BER and authors' own calculations. *Inflation expectations only less than 20% are included. **The period from 2014-2019 inflation was trending flat. ***The period from 2020-2024 inflation was trending up. See Figure 2 below.*

is on households. Direct comparisons with the other three groups are not simple because the household survey is conducted slightly differently to the other three groups.[12]

A time-series dataset of aggregate household inflation expectations is available for the period since the inflation targeting regime was introduced in 2000Q2.[13] However, disaggregated household inflation expectations data are only available for the following years and quarters: 2006Q4, 2008Q4, 2014Q4, 2015Q4, 2016Q4, 2017Q1, 2017Q2, 2018Q1, and 2019Q3 to 2024Q3[14].

Data from the earlier period (2006Q4-2018Q1) are based on a sample of approximately 2,000 households surveyed face-to-face each quarter (Reid and Siklos, 2021). These households were selected by market research companies (Nielsen and Ipsos) using statistically sound methods to ensure they were representative of the South African population. The survey question of interest asks respondents: "Over the past five years, prices increased by an average of XX percent per year. During YEAR yyyy, prices increased by XX percent. By how much do you expect prices in general to increase in the next 12 months?".[15]

From 2019Q3 onwards, the sampling and survey methodology changed, with surveys now conducted

[12]See Reid and Siklos (2021) for further details, and the expenditure patterns of each group would need to be judged using different datasets.

[13]South Africa's inflation targeting regime aimed at keeping inflation within a target range of 3-6% for the headline consumer price index between 2000Q2 and 2017Q3. Since 2017, the South African Reserve Bank (SARB) has focused its monetary policy on maintaining inflation close to the midpoint of this range, at 4.5%. In November 2025, the SARB further lowered its target 3% with 1%pt tolerance bands.

[14]Note this chapter was written with data from 2000Q2 to 2024Q3.

[15]Typically, respondents are not sampled twice, although exceptions may occur. Households are given last year's inflation rate. Hence, there is some priming. How important is it? A regression (see Table A5 in the appendix) reveals that priming has a statistically significant positive influence on inflation expectations. However, lagged inflation expectations, suggestive of the more backward-looking nature of inflation expectations, have more than three times the impact on inflation expectations than priming.

telephonically with a smaller sample of approximately 500 households each quarter.[16] Alongside the inflation expectations question, individual-level characteristics about the respondents – such as gender, age (four brackets), income (four categories), and ethnicity (four categories) – are also collected. Other characteristics, such as province and education level, are collected only for some quarters and are not available for the entire time series.

Table 2 provides the mean, standard deviation, and number of observations of inflation expectations by socioeconomic groups – truncated to remove inflation expectations above 20% to exclude outliers Reid, Siklos and Plessis (2021). The last column shows the share of observations for each socioeconomic characteristic for all inflation expectations below 20%. Overall, the mean and standard deviation across groups are closely aligned, with only subtle differences. The mean inflation expectations for female respondents[17] is lower than the mean for male respondents. One year ahead, expectations for low-income households are the highest, while those of low-mid-income households are the lowest. Black/African and Indian respondents have lower average inflation expectations compared with White respondents. Lastly, the two youngest age groups have lower average inflation expectations than the two oldest.

Figure 2 plots the aggregate inflation expectations of households and headline CPI inflation since 2003.[18] In line with the literature, household inflation expectations tend to exceed headline CPI inflation, indicating a systematic upward bias. Another notable feature of Figure 2 is that changes in aggregate household inflation expectations tend to lag headline CPI inflation. Peaks in inflation expectations often follow peaks in headline CPI inflation, suggesting that information about inflation influences survey respondents with a delay.

A common characteristic of household inflation expectations is their dispersion. The distribution of household inflation expectations often displays fat tails (Reid, Siklos and Plessis, 2021). Some of these patterns are also evident bin the South African data, as shown in Figure 3, which displays the distribution of all household inflation expectations in our dataset for inflation forecasts below 20%. The distribution of inflation expectations is non-normal, exhibiting both positive skewness (0.66) and low kurtosis (1.19).[19] The positive skewness indicates asymmetry, meaning that many households still expect inflation levels higher than the central bank's target, even though the mean expectation remains relatively close to the SARB's target band of 3–6%. The low kurtosis suggests that the distribution has a flatter peak and a broader spread than a normal distribution. While some deviation from normality is expected, given that inflation expectations do not fall below zero, kurtosis remains well below 3, implying fewer extreme outliers and a reduced likelihood of large deviations from the mean. Furthermore, since the data in Figure 3 excludes inflation expectations above 20%, the presence of extreme values is limited. The regular little humps along the distribution reflect the well-documented tendency among respondents to select round numbers, especially among the less informed ones – see Binder (2017) and Crowther-Ehlers (2019).

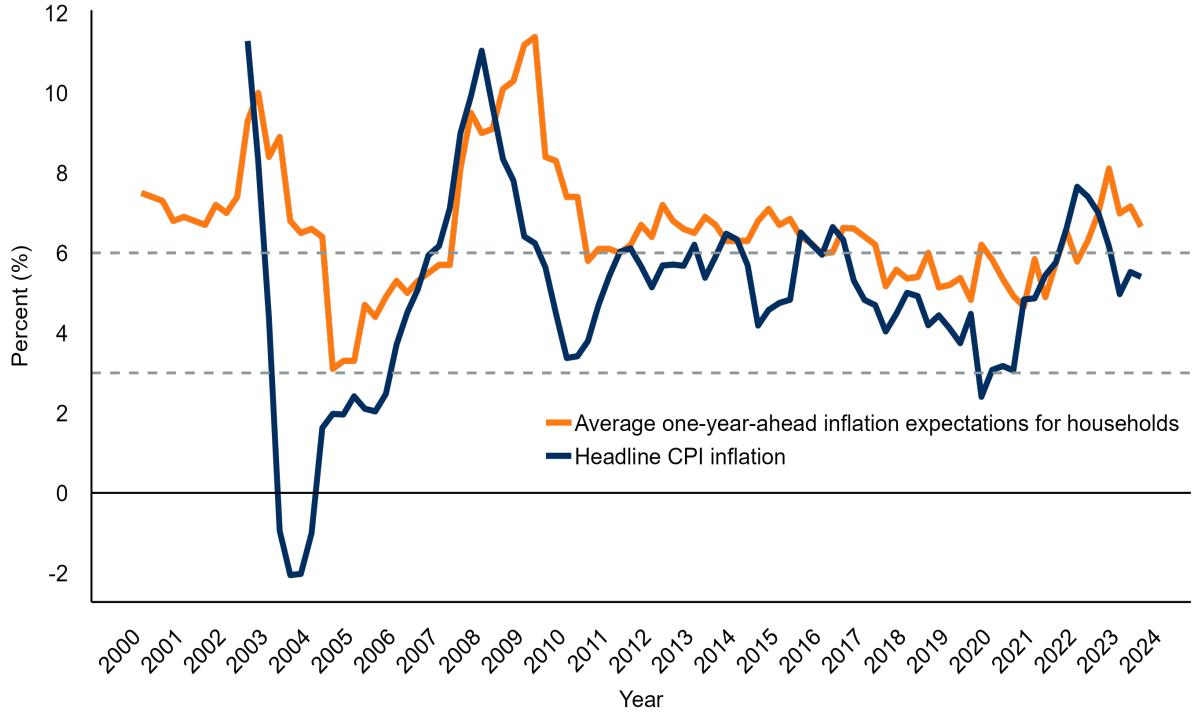
[16] The change in methodology was due to Nielsen scaling back on sampling frequency due to weak demand for survey services. To maintain quarterly sampling, the BER opted for a smaller sample size. These surveys now focus solely on inflation expectations and are no longer part of a broader survey omnibus.

[17] Even though the inflation expectations data is representative of households, the socioeconomic characteristics collected are for the main survey respondent.

[18] In January 2003, Stats SA adopted the COICOP (Classification of Individual Consumption According to Purpose) framework. This international standard, developed by the UN, is used to classify consumption expenditures consistently across countries. It replaced an older, less detailed and internationally aligned system.

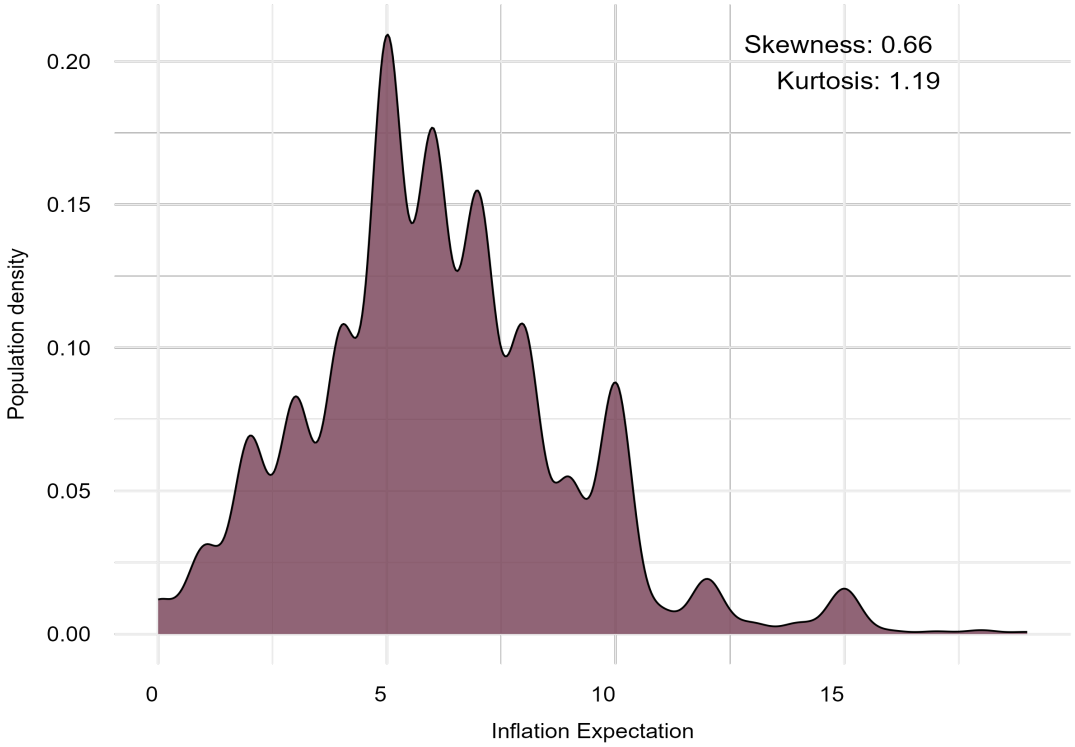
[19] A normal distribution has a skewness of 0 and a kurtosis of 3.

Figure 2: *Average one-year ahead inflation expectations for households and Headline CPI Inflation*



Source: BER and Stats SA. The dashed lines represent the SARB's inflation target range.

Figure 3: *Distribution of one-year ahead household inflation expectation Below <20%*



Source: BER Household Inflation Expectations and own calculations

3.3. Prices

Data on prices is captured by Stats SA's monthly Consumer Price Index (CPI). Although CPI is published monthly, we averaged the index by quarter and calculated the year-on-year price changes to make it comparable to the quarterly inflation expectations data. Figure 4 illustrates the year-on-year price changes since 2002[20] for the overall CPI and the three critical subcategories that we consider in this paper, namely food and non-alcoholic beverage inflation (henceforth food, for brevity), housing and utilities, and transport inflation (see Table 1).

The price data reveal four distinct peaks in food price inflation: 2007/08, 2010/11, 2015/16, and most recently, 2022/23. While international shocks drove most of these spikes, the 2015/16 surge resulted from a severe two-year drought in Southern Africa (2014-15), which sharply reduced key crop yields, including maize (Gbegbelegbe et al., 2024).

Housing and utilities inflation has remained relatively stable, except for significant fluctuations in the first decade of the sample. The sharp decline and subsequent rebound in this category stem from a methodological change in the measurement of housing and utilities inflation.[21] Transport inflation, by contrast, has been highly volatile, with a notable peak in 2021–2022 following Russia's invasion of Ukraine.

The dashed horizontal lines in the figure indicate the SARB's official inflation target band of 3% to 6%.[22] Food and transport inflation are typically much more volatile than headline CPI inflation and therefore more frequently fall outside the target range. This greater volatility may heighten salience.

4. Econometric specification and empirical results

4.1. Econometric specification

To test for bias, we compare the responsiveness of household inflation expectations to the share of income allocated to a specific good or service. If inflation expectations react more (less) than proportionately to a given item's expenditure share, this would suggest that households are over- or underweighting its price changes relative to its actual importance in their consumption basket. The data enable us to test this not only in aggregate, but also across different income groups, which presumably face very different economic conditions.

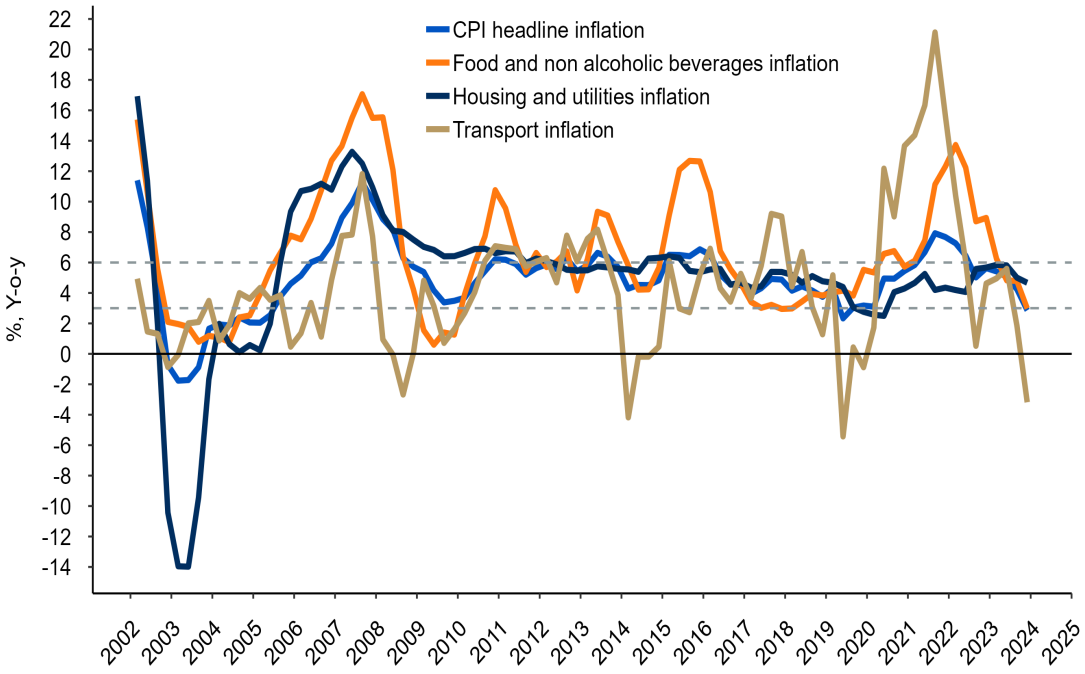
The methodological approach employs a pooled regression. The benchmark pooled regression specification is shown below as Equation (1).

[20] Before 2002, only CPIX inflation (i.e. consumer price inflation excluding the mortgage rate for metropolitan and non-metropolitan areas) was measured.

[21] Before 2009, housing inflation was directly linked to mortgage interest rates. After 2009, it became more stable as owners' equivalent rent and actual rent replaced the previous interest-rate-based measure.

[22] The target was formally changed by the Minister of Finance of SA in Nov 2025 to 3% with a 1% point tolerance band. This, however, is not shown in your figure because the event is outside of your sample period.

Figure 4: *Quarterly inflation for headline CPI, food, transport, and housing inflation*



Source: Stats SA and authors' calculations. The dashed lines are the SARB's inflation target range.

$$\pi^{e}_{j,t} = \beta_0 + \beta_1 \pi^{e}_{j,t-1} + \beta_2 \Delta CPI_{Food,t} + \beta_3 \Delta CPI_{Housing,t} + \beta_4 \Delta CPI_{Transport,t} + \boldsymbol{\alpha_j X_{j,t}} + \boldsymbol{\gamma_j (\Delta CPI_{n,t} \times X_{j,t})} + F_t + \epsilon_{j,t} \quad (1)$$

In Equation 1, the dependent variable $\pi^{e}_{j,t}$ is the household's expected one-year-ahead inflation rate, measured in percentage points. The subscript j refers to each household. β_1 is the coefficient that estimates persistence, i.e., to what extent the average of past inflation expectations (π^{e}_{t-1}) passes through to current inflation expectations.[23] Coefficients β_2 to β_4 measure the pass-through from year-on-year inflation in food and non-alcoholic beverages, housing and utilities, and transport CPI categories at time t, also measured in percentage points.[24] $\boldsymbol{X_{j,t}}$ are control variables, namely age, household income, gender and ethnicity, while $\boldsymbol{\alpha}_j$ is the vector of coefficients of these variables for each household. The controls are discussed below.

Equation 1 also includes interaction terms to examine how sensitivity to the CPI inflation categories varies by household socioeconomic characteristics; that is, the coefficient $\boldsymbol{\gamma_j}$ captures the interaction between the CPI inflation categories and household socioeconomic characteristics. F_t denotes the time

[23] We recognize the possibility that there is a distributed lag relationship between Food, Transport and Housing inflation and current inflation expectations. Stated differently, it is possible that current and lagged values of food, transport, and housing inflation impact the dependent variable. We omit this because (a) we experiment with lags on these variables and (b) as we fine-tune the categories, there can be relatively few degrees of freedom, and we wish to avoid losing too many of these.

[24] The correlation coefficients between food and non-alcoholic beverages and housing and utilities and transport CPI are 0.35 and 0.58, respectively. The correlation between housing and utilities, and transport is 0.14. See Table A2 for all the correlation coefficients.

fixed effect, capturing factors to which all households were exposed in a given year, i.e., systematic time trends. $\epsilon_{j,t}$ is the error term. As a robustness test, we also included interaction effects between food, housing, and transport inflation and each household's socioeconomic characteristics. Estimates are reported in Table B2 and are not shown here because the results were unaffected.

To evaluate bias, we compare the responsiveness of household inflation expectations to the share of income allocated to a specific good or service. If inflation expectations react more (less) than proportionally to a given item's expenditure share, this would suggest that households are over- or underweighting their price changes relative to their actual importance in their expenditure basket, which implies the responses of the survey are biased relative to information on their own expenditure patterns.

Some possible weaknesses of this model include ignoring heterogeneity across groups, which we address by testing for interaction effects between the main independent variables and each household's socioeconomic characteristics. We test the statistical significance of these differences, reported in Table B2. The conclusions reported below are unaffected.

Another possible challenge is heteroskedasticity, in which the variance differs across households or groups. We use clustered standard errors, clustering by year, to account for this. Clustering by year assumes that shocks affecting households within the same year are correlated, but are independent across years. We also include time fixed effects to account for common shocks or time-specific factors that affect all observations.

4.2. Empirical results

4.2.1. Pass-through

In columns (1)–(4) of Table 3, the results of the baseline pooled regression with the prices of each of the expenditure categories are presented separately. The baseline specifications aim to identify the pass-through ($\boldsymbol{X_{j=0,t}}$) of specific CPI components onto household inflation expectations. In the first regression (column (1)), a baseline model is presented, without any control variables. This baseline model estimates the impact of each of the three expenditure categories on inflation expectations. In columns (2)–(4), alternative specifications were estimated to test the sensitivity of the results when different measures of food or fuel prices were used.

The results in columns (1)–(4) of Table 3 indicate that inflation in food and non-alcoholic beverages, food more broadly, and housing exerts a positive and economically meaningful effect on inflation expectations. By contrast, measures of fuel price inflation – whether transport CPI, direct fuel prices, or Brent crude oil prices – have a negligible, and in most cases statistically insignificant, effect on expectations. However, the specification reported in column (4) yields statistically significant coefficients for both food and non-alcoholic beverages and Brent crude oil inflation, and also achieves the highest R^2 among the specifications considered.

Column (5) in Table 3 is the final regression that includes the measures of the expenditure categories that performed best in columns (1)–(4), as well as a range of control variables and interaction terms. Column (5) is therefore the final regression.

Column (5) controls for the different socioeconomic characteristics (income, age, ethnicity, gender – $\boldsymbol{X_{j,t}}$), as well as interaction terms with food and housing CPI inflation and income. By including interaction terms ($\boldsymbol{\Delta CPI_{n,t} \times X_{j,t}}$), the specification also tests whether the pass-through of the different CPI components differs by socioeconomic characteristics ($\boldsymbol{\gamma_j}$). However, results from Wald tests, as shown in Table B2, reveal that including additional interaction effects with age, ethnicity or gender, or interacting household income with Brent Crude Oil inflation are all statistically insignificant. Two statistically significant interaction terms are household income's interactions with food and non-alcoholic beverages inflation, and with housing and utilities inflation. Finally, controlling for the average household inflation expectations in the last quarter serves as a proxy for the dependent variable's persistence. Time-fixed effects are not shown in the table to conserve space but are relegated to the Appendix – see Table B1.

The coefficients for the socioeconomic characteristics (those without any interactions) in column (5) in Table 3 render the coefficients in line with the findings from the South African literature (Reid, Siklos and Plessis, 2021). The coefficients for the two oldest age groups (*Age 34-50* and *Age 50+*) are positive and statistically significant, suggesting that relatively older households have higher average inflation expectations. The coefficient for *Male* in column (5) is negative (-0.13) and statistically significant, and is also consistent with what others in the literature have found. The coefficients for *Coloured*, *Indian/Asian* and *White* are also positive and statistically significant. Hence, all groups display higher inflation expectations than the *Black* category. Finally, the results indicate that pass-through across all household income groups is not statistically different from that of the high-income reference households.

Table 3: *Pass-through effects of food, housing and utilities and transport inflation to household inflation expectations*

	(1) Baseline	(2) Baseline with alternative measure of food inflation	(3) Baseline with alternative measure of fuel inflation	(4) Baseline with 2nd alternative measure of fuel inflation	(5) Final model with added interaction terms
Constant	3.88 (0.72)***	3.86 (0.68)***	3.78 (0.68)***	4.22 (0.59)***	0.95 (2.36)
Food inflation	0.13 (0.08)				
Transport CPI inflation	0.00 (0.05)	−0.01 (0.04)			
Housing and utilities inflation	0.19 (0.20)	0.17 (0.20)	0.18 (0.21)	0.06 (0.18)	0.07 (0.20)
Food and non-alcoholic beverage inflation		0.16 (0.09)+	0.17 (0.10)+	0.19 (0.08)*	0.16 (0.05)***
Fuel (95 unleaded coastal)			−0.01 (0.01)		
Brent Crude Oil inflation				−0.01 (0.01)*	0.00 (0.00)
Last quarter's aggregate HH inflation expectations					0.32 (0.11)**
Food and non-alcoholic beverage inflation × High-mid income					−0.03 (0.02)+
Food and non-alcoholic beverage inflation × Low-mid income					−0.06 (0.02)*
Food and non-alcoholic beverage inflation × low-income					−0.04 (0.02)*
Housing and utilities inflation * High-mid income					0.04 (0.02)
Housing and utilities inflation * Low-mid income					0.07 (0.03)**
Housing and utilities inflation * Low income					0.06 (0.04)
High-mid income					0.05 (0.16)
Low income					0.04 (0.20)
Low-mid income					−0.23 (0.21)
Age 25-34					0.06 (0.07)
Age 34-50					0.16 (0.07)*
Age 50+					0.43 (0.12)***
Male					−0.13 (0.04)***
Coloured					0.12 (0.13)
Indian/Asian					0.47 (0.12)***
White					0.41 (0.11)***
Fixed effects	Time	Time	Time	Time	Time
Num.Obs.	20820	20820	20820	20820	20820
R2 Adj.	0.077	0.082	0.083	0.104	0.169
RMSE	2.73	2.72	2.72	2.69	2.59

Source: Authors' estimations based on Equation 1

*Notes: Significant levels: +=.1, *=.05, **=.01, ***=0.001. High-income households is the reference group, Time fixed effects are not shown in this table. All dependent variables exclude inflation expectations above 20%, unless otherwise indicated. Moreover, the Wald test was used to test whether other interaction terms with age and gender were statistically different from zero. There was not sufficient evidence to reject the null hypothesis. Clustered standard errors are in parentheses. The sample consists of quarterly data for the following periods: 2006Q4, 2008Q4, 2014Q4, 2015Q4, 2016Q4, 2017Q1, 2017Q2, 2018Q1, and 2019Q3 to 2024Q3.*

4.2.2. Pass-through and bias by category

Food price pass-through estimates and bias

As previously shown in Table 1, food is a significant expenditure category for South African households. Hence, we would expect changes in food prices to have a large impact on inflation expectations. Comparing the results of columns (1) and (2) in Table 3 reveals that the pass-through of food inflation to inflation expectations is better captured using the broader category of food and non-alcoholic beverages (FNAB) than by using the narrower food category.[25] The food category consistently exhibits a positive and statistically significant pass-through on average to inflation expectations across multiple model specifications, even after incorporating control variables and interaction terms, as in column (5) in Table 3.

Table 4 compares food pass-through against expenditure shares (see also Figure 1). Column (1) presents the share of food[26] in total expenditure (see Table A1 in the Appendix), which ranges from an average of 8.4% for high-income households to over 30% for low-income households. Column (2) reports the estimated model coefficients from column (5) in Table 3. The model coefficients show the pass-through coefficient for food to household inflation expectations, without accounting for any interaction terms.

Column (3) displays the coefficients for the interaction terms, illustrating how food price pass-through varies across different household income groups. The negative interaction effects in rows 2–4 indicate that, relative to the high-income reference group, the pass-through effect is weaker for households in the high-mid to low-income range. We expect the interaction terms to be positive for lower-income households, as they spend a greater share of their income on food and should therefore be more sensitive to changes in food prices. Instead, the coefficient on the interaction term is largest for the low-mid-income group and virtually the same for the high-mid and low-income groups.[27]

Table 4: *Comparison of food price pass-through with the share of food in total expenditure*

	(1) Share of food in total expenditure (%)	(2) Model coefficient for food inflation pass-through	(3) Model coefficients for interaction effects[2]	(4) Pass-through coefficients (2) + (3)[3]
High income[1]	8.4	0.16 (0.05)***		0.16
High-mid income	14.9	0.16 (0.05)***	−0.03 (0.02)+	0.13
Low-mid income	24.3	0.16 (0.05)***	−0.06 (0.02)*	0.10
Low income	30.0	0.16 (0.05)***	−0.04 (0.02)*	0.12

*Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '+' 0.1 ' ' 1*

[1] *High-income households is the reference group.*
[2] *This coefficient captures the interaction effect of household income and food inflation (see Table 3)*
[3] *The pass-through effects of food for each household income group is calculated by summing the coefficient in column (2) with the interaction effect for each household income group in column (3). Clustered standard errors are in parentheses.*

Column (4) in Table 4 sums the coefficients from columns (2) and (3) to estimate the overall pass-through effect for each household income group. The results suggest that low-income households exhibit

[25] Even though the international standard categorizes this as "food and non-alcoholic beverages," and this is technically the category we include in our final regression (column (5) in Table 3), we refer to it simply as 'food' for brevity. This aligns with the results in Table A1, which show that food constitutes the largest share of the overall food and non-alcoholic beverage category.
[26] Note that this refers to the entire food and non-alcoholic beverage category.
[27] See Wald test results in Table B3.

a somewhat weaker pass-through (0.12, or 12%), compared with high-income households (0.16, or 16%). However, we find these differences are not statistically different from each other (reported in Table B3), implying that the overall, or aggregate, pass-through effects across household income groups are statistically very similar. This finding is novel in the SA literature and, to the best of our knowledge, has not been reported elsewhere, as there are very few comparisons between household income groups. A pass-through coefficient of 0.16 implies that a one percentage point (%pt) increase in food inflation raises household inflation expectations by 0.16%pts. In other words, inflation expectations adjust by 16% of the change in food inflation. A similar interpretation applies to the other pass-through coefficients.[28]

Next, we compare the pass-through coefficients with the relative share of food in total expenditure for each household income group. Interestingly, the coefficients in Table 4 reveal an important observation: as the share of food in total expenditures rises, as seen in column (1), the pass-through values in column (4) decline. It is not the case that income groups that devote a greater proportion of their expenditure to food have a higher food-price pass-through. Surprisingly, lower-income households react less to food price inflation than high-income households, despite having a higher food expenditure share.

For high-income households, the larger coefficient of 0.16 suggests that these households overweight food prices relative to their actual spending and relative to low-income households. The precise reason is unclear, but saliency bias provides a plausible explanation.[29] Given that food prices are often highly visible, due to frequent exposure, and may be subject to sizeable changes and relatively volatile, these price changes could be easier to recall when high-income households form their inflation expectations, leading them to rely on food price information suboptimally. This is most likely to occur if food is purchased more frequently, which will likely render it top-of-mind when consumers form inflation expectations. Some international evidence (Armantier et al., 2016; Ferrucci et al., 2010; Kikuchi and Nakazono, 2023), suggests that changes in food prices affect the formation of inflation expectations, and inattentive consumers may interpret these changes as indicators of broader fluctuations in headline inflation rates.

We find a weaker pass-through coefficient for low- and low-mid-income households, even though food accounts for between 24.3% and 30% of their consumption baskets, respectively. This suggests that these households underreact to food price changes relative to their actual food spending and to high-income households. This finding is somewhat counterintuitive since food constitutes a larger portion of their consumption. Unfortunately, the data do not allow us to control for education, which may be essential to explain the results for the lower-income households. Unlike the other three household income groups, high-mid income households exhibit a pass-through coefficient roughly proportional to their food expenditure share (14.9%), suggesting neither an over- nor underweighting of food price changes relative to actual spending.

Overall, our findings suggest that three out of four household income groups exhibit some form of bias, as their pass-through coefficients either exceed or fall short of the share of food in expenditure. This aligns with the domestic and international literature, which frequently highlights systematic biases in household inflation expectations (Weber et al., 2022; Reid, Siklos and Plessis, 2021). However, it is

[28] Our estimates suggest a bias of the kind mentioned earlier since expectations underreact to changes in observed food prices.

[29] We lack data on household purchase frequency to test what exactly is the source of bias.

worth noting that lower-income households in our data showed a weaker response than expected. Even the high-mid-income households responded proportionally to changes in food inflation, but the response was smaller than expected, given that food inflation is salient. This means that the response to food prices is smaller than expected for three of the four household income groups, suggesting that these households are less sensitive to relative changes in food prices. If we assume that the information set used by households is the expenditure basket of the relevant household income group, we would expect lower-income households, who spend a greater proportion of their income on food, to adjust their inflation expectations more than higher-income households, who spend a smaller proportion of their income on food.

Our finding for high-income households is consistent with research on the average U.S. consumer, who also overreacts to salient prices relative to their actual expenditure shares (Binder, 2018). Furthermore, studies show that food prices have a significant influence on headline inflation expectations (Aidala et al., 2024; Dietrich, 2024; Murphy and Rohde, 2018; Trehan, 2011). On the other hand, our results for lower-income households contrast with these findings. This could be due to differences in purchasing behaviour between income groups. However, another explanation may be priming in the survey question, where survey respondents are given the headline inflation rate for the past 12 months as a reference. Although this is used to reduce outliers in responses, it also limits response variation and may limit the responsiveness of inflation expectations to changes in food prices (e.g., see Reid, Odendaal, Siklos and Du Plessis (2021)).

Housing & utilities price pass-through estimates and bias

Next, we consider the pass-through from housing inflation to inflation expectations, since some interaction terms are statistically significant.

Table 5: *Comparison of housing price pass-through with the share of food in total expenditure*

	(1) Share of housing in total expenditure (%)	(2) Model coefficient for housing inflation pass-through	(3) Model coefficients for interaction effects[2]	(4) Pass-through coefficients (2) + (3)[3]
High-income[1]	33.3	0.07 (0.06)		0.07
High-mid-income	34.4	0.07 (0.06)	0.04 (0.02)	0.11
Low-mid-income	36.0	0.07 (0.06)	0.07 (0.03)**	0.14
Low-income	36.7	0.07 (0.06)	0.06 (0.04)	0.13

*Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '+' 0.1 ' ' 1*

[1] *High-income households is the reference group.*

[2] *This coefficient captures the interaction effect of household income and food inflation. See Table 3.*

[3] *The pass-through effects of food for each household income group is calculated by summing the coefficient in column (2) with the interaction effect for each household income group in column (3). Clustered standard errors are in parentheses.*

Column (1) of Table 5 shows the share of household expenditures allocated to housing across household income groups, which ranges from 33.3% for high-income households to 36.7% for low-income households. Housing and utilities account for a substantial share of expenditures across all household income groups, though the difference between low- and high-income households is less pronounced than for food.

Column (2) shows the estimated model coefficients obtained from column (5) in Table 3. The model

coefficients show the pass-through coefficient from housing to household inflation expectations, without accounting for any interaction terms. The high-income group serves as the reference category. Column (3) presents the interaction terms for the other three household income groups. Only the interaction effect for the low-mid-income group (0.07 or 7%) is statistically significant at the 95% confidence level.

Column (4) adds together the coefficients from columns (2) and (3) to determine the overall pass-through effect for each income group. Although some variation exists between the coefficients for the four income groups, Wald test results indicate that these coefficients are not statistically different from each other (Table B3). The results from the Wald test imply that we cannot draw strong inferences about the absolute differences in pass-through coefficients; however, we can still compare them with the expenditure shares in Column (1). A pass-through coefficient of 0.07 implies that a one percentage point (%pt) increase in housing inflation raises household inflation expectations by 0.07%pts. In other words, a 10%pts rise in housing costs lifts inflation expectations by 0.7%pts on average.

A comparison of the pass-through coefficients in column (4) with the expenditure shares of housing from column (1) shows that all income groups have pass-through coefficients smaller than their respective shares of expenditure on housing, unlike the food pass-through coefficients discussed earlier. This suggests that households are less sensitive to housing price changes than their expenditure share would suggest. For example, low-income households allocate 36.7% of their income to housing, yet their inflation expectations adjust by approximately 13% in response to housing costs – nearly a third lower. The salience of the components of housing-related costs is likely to differ: some, such as electricity, are likely to be salient given the publicity on Eskom's[30] poor performance. While housing costs are sizeable, they are typically paid once a month (less frequently than many other goods and services), and they have a fixed price for longer periods (they are less volatile). The lower volatility and less frequent purchases are characteristics of housing costs that would lower their salience.

If households used information about their own expenditure baskets efficiently, we would have expected them to respond proportionally to the share of housing in their baskets. However, the results suggest that households do not fully incorporate this information when forming inflation expectations. The result is also surprising considering that the SA economy was plagued with load-shedding (timed power cuts) for much of the period under consideration, which should have made electricity costs more salient and thus made consumers more sensitive to such price changes.

Although the literature on housing and utilities pass-through is limited, our findings align with those of Cacnio and Basilio (2022), who also found a weak response to housing price changes in the Philippines. Moreover, our estimate is consistent with U.S. research indicating that core prices, including housing, tend to be less influential (Trehan, 2011; Dietrich, 2024). Patzelt and Reis (2024) moreover finds that electricity prices[31] in the Eurozone matter for inflation expectations, although less so than they likely would under a rational expectations assumption. Our results, however, stand in contrast to those of a paper by Dhamija et al. (2025) who find significant overweighting of house price inflation[32] in U.S.

[30] Eskom is South Africa's state-owned electricity provider.

[31] This is important for housing and utilities inflation in South Africa because this sub-category includes electricity prices.

[32] Note this paper focuses on house prices and not the housing category in consumer prices.

inflation expectations, more so than for other goods.

Transport price pass-through estimates and bias

As per the model estimates shown in Table 3, transport inflation appears to have minimal pass-through to household inflation expectations. Even when testing different proxies for transport inflation in columns (1), (3), and (4) – such as fuel price or Brent Crude Oil (international oil) price inflation – the estimated coefficients remain very small and, at times, zero[33]. For example, the coefficient for Brent Crude oil price inflation in Model (4)[34] is -0.01 and is statistically significant at a 95% level. A pass-through of -0.01 is very small, implying that if Brent Crude Oil prices rise by 10%pt, inflation expectations will adjust by 0.1%pts.

It is somewhat surprising that transport inflation (and its proxies), which accounts for between 7.9% and 19.2% of household income expenditure, does not exhibit more substantial pass-through to inflation expectations. This muted responsiveness to overall transport costs may be attributed to differences in spending patterns across its subcategories, as shown in Table A1. Lower-income households allocate a larger share of their transport expenditure to public transportation, meaning they mostly experience indirect fuel costs, which are less flexible than the fuel price itself.[35] In contrast, higher-income households spend more on vehicle-related expenses, with fuel accounting for only a small portion of their total transportation expenditure.

Since fuel prices are typically viewed as one of the most salient components of transport costs, yet relatively few respondents are directly exposed to them, it is perhaps unsurprising that our results indicate a weak link between transport inflation and inflation expectations. However, given that transport remains the third-largest expenditure category for most households, the findings suggest that households do not respond rationally to this price category.

Previously, Sibanda et al. (2015) found that oil prices had a statistically significant effect on market-based inflation expectations in South Africa. Yet, our results do not support this relationship for household inflation expectations. Similarly, Murphy and Rohde (2018) for professional forecasters in the U.S., and Aidala et al. (2024) for U.S. households, found a very small pass-through coefficient for energy prices, with inflation expectations not reacting in proportion to the share of energy in household consumption. More broadly, our findings align with the U.S. literature, which suggests that the correlation between inflation expectations and oil prices is weak since inflation expectations have become more anchored (Bernanke, 2007). Aidala et al. (2024) and Murphy and Rohde (2018) also find that food prices are often weighted more heavily than energy prices[36], and our results seem to support this finding, even though our definition of energy inflation differs from that of the U.S. literature[37]. However, our results contrast with Coibion and Gorodnichenko (2015*b*), who attribute the missing disinflation in the U.S. during the

[33]Wald tests as shown in Table B2 also confirm that it is does not add statistical value to include interaction effects between Brent Crude Oil price inflation and household income, age, gender, and ethnicity.

[34]Our specifications rely on Brent Crude Oil price inflation (instead of fuel or transport inflation), since it adds the most explanatory power to the regression results.

[35]The taxi fares also tend to rise when the fuel price rises, but not to decrease when it goes down.

[36]Energy as an input has become less intensive than when the first two oil price shocks took place thanks to technological developments that have permitted more efficient use of energy (i.e., oil intensity has declined substantially since the 1970s).

[37]They use mostly gasoline price inflation in the U.S. literature.

Great Recession (2009) to the high responsiveness of households' inflation expectations to elevated energy prices at the time, which may have prevented a downward price adjustment. This finding suggests that we should consider the possibility that pass-through effects may be nonlinear.

4.3. Nonlinearity in pass-through

An important aspect highlighted in the literature is the asymmetry of pass-through. Evidence shows that rising oil prices have a more substantial pass-through to inflation expectations than falling oil prices. Nonlinearity may be an important feature of pass-through effects for policymakers to be aware of because if an acceleration (or increase) in prices has a disproportionate effect[38] on inflation expectations relative to a deceleration (or decrease), it could ultimately lead to asymmetric inflationary pressures, which would have implications for monetary policy. In particular, asymmetry implies that policy rate changes will differ during episodes of rising versus falling inflation.

To test for nonlinearity in responses, we added an acceleration dummy for each of the different price categories: food, Brent Crude Oil, and housing inflation. The acceleration dummy for each of these categories equals 1 if inflation rises in the current quarter relative to the previous quarter; conversely, it takes on the value of 0 if inflation is lower than in the last quarter, as shown in Equation 2, below.

$$Acceleration\ dummy = \begin{cases} 1, when\ \Pi_t - \Pi_{t-1} > 0 \\ 0, when\ \Pi_t - \Pi_{t-1} \leq 0 \end{cases} \tag{2}$$

The results presented in Table 6 indicate that the acceleration dummy for food inflation is negative (-0.65) and statistically significant at a 99.9% confidence level. This suggests that when food inflation accelerates, pass-through rates are lower than when it decelerates. The literature argues that accelerating inflation should be more visible and salient, making it more memorable when eliciting inflation expectations and leading to greater pass-through rates. Therefore, we would expect a positive coefficient for accelerating food inflation. However, our result contradicts the literature and our initial expectations.

To investigate further, we assess the sensitivity of our results by splitting the sample into two periods: one in which headline inflation remained relatively stable (2014–2019) and another in which headline inflation was rising (2020–2023).[39] This allows us to examine whether pass-through coefficients differ depending on the overarching headline inflation trend. In columns (3) and (4) of Table 6, we observe that during the period of relatively stable inflation, there is a stronger pass-through (0.32, or 32%) of food inflation to inflation expectations compared with our baseline result in column (1). When the inflation trend is positive, as shown in column (4), household inflation expectations were significantly less responsive (0.12, or 12%). In fact, the pass-through to inflation expectations was more than double in the stable inflation period compared with the increasing inflation period. Wald tests further confirm that these coefficients are statistically different from each other at a 95% confidence level – see Table B4.

[38] A disproportionate effect may include a larger pass-through coefficient or greater persistence of a price change, meaning the effect takes longer to dissipate.

[39] We used a Kalman filter to estimate the underlying dynamics of headline CPI inflation. The state-space model with Kalman filtering is adaptive to structural changes, making it a robust approach for identifying trend inflation. The correlation coefficients between food and non-alcoholic beverages and housing and utilities and transport CPI for when inflation is flat and increasing are shown in Tables A3 and A4, respectively.

One possible interpretation of these results is that household inflation expectations tend to be more responsive to food inflation – showing higher pass-through – when inflation is stable, because households are more attentive to food inflation than to headline inflation. The idea is that they rely more on salient price signals that are easier to recall (such as food) when forming inflation expectations. Conversely, when inflation rises, individuals may become more aware of the broader factors driving headline inflation and, as a result, dedicate more effort to collecting more accurate information about a broader range of prices and the aggregate state of the economy. The pass-through of food inflation to expectations thus declines. This interpretation is consistent with the literature on inattention (Mankiw et al., 2003; Cavallo et al., 2017), which suggests that individuals and households are rationally inattentive to headline inflation drivers when inflation is low, as updating their inflation beliefs requires (often unnecessary) cognitive effort. However, when inflation increases, there is more incentive to monitor inflation closely and become aware of the fundamental drivers of price changes in the economy.

Turning to asymmetry in housing inflation pass-through, the results contrast with those for food inflation. Column (2) in Table 6 shows that the dummy for accelerating housing inflation is positive (0.54) and statistically significant at a 99.9% confidence level. The coefficient indicates that households are more responsive to housing inflation when it is accelerating.

Looking at the coefficients for housing inflation in columns (3) and (4) in Table 6, which compare pass-through under conditions of stable or increasing headline inflation, they tell the same story as column (2) in Table 6 with the housing acceleration dummy. Wald tests, as shown in Table B4, reveal that $Housing\ and\ utilities\ inflation_{flat}$ and $Housing\ and\ utilities\ inflation_{increasing}$ are statistically different from each other, at a 90% confidence level. This suggests that the pass-through of *housing inflation* to household inflation expectations increased (and inched closer to the share of income households spend on the category) during the period of rising inflation. However, it is still well below the 33%–37% range households spend on housing, as shown in Table 5. This supports our earlier finding that the pass-through of housing and utilities inflation is weaker than its share in expenditure.

Finally, our interpretation of the pass-through of oil price inflation remains unchanged when considering potential asymmetric responses. *Brent Crude Oil* prices seem to have very little to no pass through to household inflation expectations, whether CPI inflation is stable or increasing. Unlike for food inflation, there is no sample sensitivity from the stable sample to the accelerating sample. Our proxy may be too crude, which could explain the result obtained.

Table 6: *Asymmetry in pass-through effects*

	(1) Baseline model, inflation expectations <20)	(2) Model with acceleration dummy (Δ inflation>0)	(3) Model with 2014-2019 data (flat inflation trend)	(4) Model with 2020-2023 data (increasing inflation trend)
Last quarter's average for households' inflation expectation[2]	0.32 (0.07)***	-0.01 (0.09)	0.50 (0.10)***	0.39 (0.08)***
Food and non-alcoholic beverage inflation[1]	0.16 (0.02)***	0.15 (0.02)***	0.32 (0.12)**	0.12 (0.04)**
High-mid income	0.05 (0.15)	0.03 (0.15)	-0.08 (0.72)	0.35 (0.88)
Low income	0.04 (0.17)	0.02 (0.17)	1.25 (1.05)	0.70 (0.52)
Low-mid income	-0.23 (0.15)	-0.24 (0.15)	-0.50 (0.74)	0.02 (0.93)
Brent Crude Oil price inflation	0.00 (0.00)	0.00 (0.00)+	-0.01 (0.01)	0.00 (0.00)
Housing and utilities inflation	0.07 (0.06)	-0.13 (0.07)+	-0.31 (0.85)	0.09 (0.09)
Food and non-alcoholic beverage inflation[1]× High-mid income	-0.03 (0.02)	-0.04 (0.02)+	-0.02 (0.03)	-0.11 (0.11)
Food and non-alcoholic beverage inflation[1]× Low income	-0.06 (0.02)**	-0.06 (0.02)***	-0.07 (0.03)**	-0.06 (0.04)+
Food and non-alcoholic beverage inflation[1]× Low-mid income	-0.04 (0.02)+	-0.04 (0.02)*	-0.03 (0.03)	-0.08 (0.11)
Housing inflation[1]× High-mid income	0.04 (0.03)	0.04 (0.03)	0.03 (0.14)	0.11 (0.15)
Housing inflation[1]× Low income	0.06 (0.03)*	0.07 (0.03)*	-0.15 (0.18)	-0.05 (0.12)
Housing inflation[1]× Low-mid income	0.07 (0.03)*	0.08 (0.03)**	0.09 (0.14)	0.16 (0.15)
Accelerating Food and non-alcoholic beverage inflation		-0.65 (0.12)***		
Accelerating Brent Crude Oil inflation		-0.12 (0.09)		
Accelerating housing[1]inflation		0.54 (0.11)***		
Num.Obs.	20820	20820	11530	4464
R2 Adj.	0.169	0.171	0.067	0.077
RMSE	2.59	2.59	2.44	2.72

Clustered standard errors are in parentheses.

[1] Housing inflation refers to the entire housing and utilities category, which also includes water, sanitation and electricity prices.

[2] Last quarter's average for households' inflation expectation accounts for persistence in the inflation expectation data.

5. Conclusions

In this paper, we examined how household inflation expectations are formed in South Africa, testing whether their pass-through matches the share of expenditure on particular goods. The literature consistently finds that household inflation expectations tend to be biased upwardly relative to realized inflation. In this paper, we explore whether households' expenditure baskets influence how they form their inflation expectations. Systematic biases in inflation expectations emerge when households over- or underweight specific prices relative to their actual expenditure shares.

To investigate these biases, we estimated the pass-through of inflation to household inflation expectations for key expenditure categories – food, transport, and housing. We focused particularly on differences across income groups because, to our knowledge, this has not been done previously. Our findings confirm the presence of systematic biases, with households displaying varying sensitivities to price changes that do not always align with their actual spending patterns.

In food inflation, high-income households exhibit a pass-through effect that exceeds their food expenditure share, suggesting they overweight food price changes when forming expectations. This may be explained by the saliency bias hypothesis: goods purchased frequently and more visible tend to weigh more heavily in inflation perceptions. Surprisingly, low-income households show a weaker pass-through effect than their food expenditure share would suggest, implying an underweighting of food prices when forming expectations. This could be due to differences in purchasing behaviour between income groups. However, for household income groups other than the highest category, the response to food prices is

smaller than expected, suggesting that these households are less sensitive to relative food price movements.

Pass-through coefficients for housing and utilities inflation are consistently lower than expenditure shares across all income groups. This suggests that households are less sensitive to housing cost fluctuations, likely because these expenses are relatively stable, infrequent, and less salient in daily household decision-making, especially since rent makes up the largest share of this category. This finding aligns with the international evidence showing that non-core goods, such as food and energy, exert a larger influence on inflation expectations, while housing and utilities (core goods) have a more muted effect.

Additionally, our analysis highlights the potential nonlinearity in pass-through effects, as previous research suggests that increases in inflation have a stronger impact on inflation expectations than decreases. If inflation expectations react more strongly to rising prices, this asymmetry could contribute to inflation persistence and shape how central banks respond to inflationary shocks.

Overall, our findings suggest that expectations do not overreact to categories such as food and fuel, and that housing costs do not strongly account for the upward bias observed in South African households' inflation expectations. This could be encouraging for the SARB, implying that expectations are not unduly anchored to relative price changes in highly visible goods. In this sense, the central bank may not need to adjust its approach in response to fluctuations in these categories. Nevertheless, the underlying drivers of the persistent upward bias in household inflation expectations remain unclear and warrant further investigation.

Future research could expand on these findings by examining more granular price categories to better pinpoint sources of bias. Additionally, the availability of household inflation expectations data over time allows for time-series analysis to assess how these biases evolve and whether they are influenced by central bank credibility. Investigating the role of monetary policy in shaping inflation expectations could provide further insights into how to mitigate these biases and improve inflation forecasting. We leave these extensions for future research.

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A. Appendix

Table A1: *Percentage distribution of annual household consumption expenditure by group expenditure and income deciles*

Division expenditure	Income deciles										
	Lower	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Upper**	**Total**
Food and non-alcoholic beverages	**30.5**	**29.5**	**28.6**	**26.4**	**24.3**	**21.7**	**20.4**	**17.0**	**12.8**	**8.4**	**16.3**
Food	28.5	27.7	26.8	24.7	22.7	20.2	19.1	15.7	11.8	7.6	15.1
Non-alcoholic beverages	2.0	1.8	1.8	1.7	1.6	1.5	1.3	1.3	1.1	0.7	1.2
Services for processing primary goods for food and non-alcoholic beverages	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alcoholic beverages, tobacco and narcotics	**3.2**	**2.5**	**2.2**	**2.1**	**2.0**	**1.9**	**1.7**	**1.6**	**1.0**	**0.8**	**1.4**
Clothing and footwear	**5.6**	**5.9**	**6.5**	**6.3**	**6.5**	**6.5**	**6.4**	**6.0**	**4.9**	**3.3**	**5.0**
Housing, water, electricity, gas and other fuels	**38.1**	**35.2**	**34.9**	**36.1**	**36.8**	**37.2**	**35.0**	**34.4**	**34.4**	**33.3**	**34.7**
Actual rentals for housing	12.6	6.8	5.9	6.4	5.0	5.5	6.2	5.8	5.5	3.6	5.2
Imputed rentals for housing	14.7	18.7	19.1	19.8	21.1	21.0	18.5	18.1	18.2	19.7	19.2
Maintenance, repair and security of the dwelling	0.3	0.4	0.6	0.6	0.7	0.7	0.8	0.7	0.7	1.2	0.8
Water supply and miscellaneous services relating to the dwelling	2.9	2.8	3.0	3.2	3.3	3.7	3.8	4.5	5.0	5.0	4.3
Electricity, gas and other fuels	7.7	6.5	6.3	6.2	6.7	6.2	5.6	5.3	5.0	3.8	5.1
Furnishings, household equipment and routine household maintenance	**2.3**	**2.7**	**3.2**	**3.1**	**3.3**	**3.4**	**3.3**	**3.6**	**4.1**	**5.4**	**4.1**
Health	0.6	0.7	0.7	0.6	0.8	0.7	0.7	0.8	1.1	1.4	1.0
Transport	**6.3**	**9.4**	**9.0**	**9.7**	**9.6**	**11.6**	**13.2**	**16.0**	**17.9**	**19.2**	**15.3**
Purchase of vehicles	0.3	2.4	1.6	1.6	1.0	2.2	2.8	5.2	6.9	9.8	5.8
Operation of personal transport equipment	2.3	3.0	2.4	3.1	3.1	4.3	5.2	7.0	8.4	8.3	6.4
Passenger transport services	3.7	4.0	4.8	4.9	5.3	5.0	5.1	3.7	2.4	0.9	3.0
Transport services of goods	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Information and communication	**4.2**	**4.0**	**4.4**	**4.3**	**4.7**	**4.5**	**4.8**	**4.9**	**4.7**	**4.3**	**4.5**
Recreation, sport and culture	**0.9**	**0.9**	**0.8**	**0.8**	**1.0**	**0.9**	**1.1**	**1.2**	**1.0**	**1.8**	**1.3**
Education services	**0.6**	**0.4**	**0.4**	**0.5**	**0.5**	**0.6**	**0.8**	**0.9**	**1.1**	**2.6**	**1.4**
Restaurants and accommodation services	**2.3**	**2.3**	**2.2**	**2.3**	**2.2**	**2.2**	**2.6**	**2.5**	**2.6**	**3.2**	**2.7**
Insurance and financial services	**3.0**	**3.9**	**4.2**	**4.9**	**5.1**	**5.9**	**6.7**	**8.3**	**11.3**	**13.3**	**9.3**
Personal care, social protection and miscellaneous goods	**2.4**	**2.6**	**2.9**	**2.8**	**3.2**	**2.9**	**3.3**	**2.7**	**3.0**	**3.0**	**2.9**

Source: Income and expenditure survey 2022/23

Table A2: *Correlation Matrix of Inflation Measures 2003Q1-2025Q1*

	Headline CPI	Food and non-alcoholic beverages CPI	Transport CPI	Housing and utilities CPI
Headline CPI	1.00	0.85	0.45	0.84
Food and non-alcoholic beverages CPI	0.85	1.00	0.35	0.58
Transport CPI	0.45	0.35	1.00	0.14
Housing and utilities CPI	0.84	0.58	0.14	1.00

Table A3: *Correlation Matrix of Inflation Measures during flat inflation period 2014-2019*

	Headline CPI	Food and non-alcoholic beverages CPI	Transport CPI	Housing and utilities CPI
Headline CPI	1.00	0.91	0.38	0.58
Food and non-alcoholic beverages	0.91	1.00	0.05	0.51
Transport	0.38	0.05	1.00	-0.15
Housing and utilities	0.58	0.51	-0.15	1.00

Table A4: *Correlation Matrix of Inflation Measures during increasing inflation period 2020-2023*

	Headline CPI	Food and non-alcoholic beverages CPI	Transport CPI	Housing and utilities CPI
Headline CPI	1.00	0.84	0.84	0.41
Food and non-alcoholic beverages CPI	0.84	1.00	0.47	0.27
Transport CPI	0.84	0.47	1.00	0.15
Housing and utilities CPI	0.41	0.27	0.15	1.00

Table A5: *Anchor pass-through with Wild Bootstrap Standard Errors*

	Estimate	**SE**	**t value**	**p value**
Inflation Target	0.11	0.45	0.25	0.800
Priming inflation number	0.23	0.08	3.07	0.003**
Headline CPI inflation (t-1)	-0.05	0.06	-0.80	0.424
Lag of inflation expectations (t-1)	0.77	0.07	10.76	0.000***

*Source: BER, Stats SA, and authors' own calculations. Notes: Significant levels: +=.1, *=.05, **=.01, ***=0.001.*

Table A6: *Phrasing of the household inflation expectation question in selected countries*

Country/region	Institution	Question
Canada	Bank of Canada	What do you think the rate of inflation/deflation will be over the next 12 months?
Europe (done in a number of countries)	European Commission	Qualitative: By comparison with the past 12 months, how do you expect that consumer prices will develop in the next 12 months? The following options are provided: Increase more rapidly, increase at the same rate, increase at a slower rate, stay about the same, fall, don't know. Quantitative: By how much percent do you expect consumer prices to go up/down in the next 12 months? (Please give a single-figure estimate): Consumer prices will increase by. . . % / decrease by. . . %
United Kingdom	Bank of England/TNS	How much would you expect prices in the shops generally to change over the next twelve months?
Australia	Melbourne Institute of Applied Economic and Social Research	Qualitative: Thinking about the prices of things you buy, by this time next year, do you think they'll have gone up or down? Quantitative: By what percentage do you think prices will have gone up/down by this time next year?
Japan	Bank of Japan	Qualitative: What is your outlook for prices of overall goods and services you purchase one year from now? Quantitative: By what percent do you think prices will change one year from now?
New Zealand	Reserve Bank of New Zealand/UMR Research	Qualitative: In 12 months' time, do you expect the inflation figure to be higher, lower or the same? Quantitative: What do you think the actual (inflation) figure will be in 12 months' time?
Sweden	National Institute of Economic Research	Qualitative: Compared to the situation today, do you think that in the next 12 months prices in general will. . . increase faster, increase at same rate, increase at slower rate, stay same, fall, don't know Quantitative: By how much percent do you think prices will rise/fall (i.e. what the rate of inflation/deflation will be) over the next 12 months?
India	Reserve Bank of India	Qualitative: What is your expectation for general prices in the next year? Increase more than current rate, similar, less, no change, decline Quantitative: Inflation (defined as annual rate of the price change) rate after one year. Number of options, stretching from <1% to >16%
Indonesia	Bank of Indonesia	What do you expect on prices for goods/services in general for the next 6 months compared to today? Increase (give %), remain unchanged, decrease (give %)
United States	University of Michigan	Qualitative: During the next 12 months, do you think that prices in general will go up, or go down, or stay where they are now? Quantitative: By about what percent do you expect prices to go (up/down) on the average, during the next 12 months?
United States	Conference Board	By how much do you expect prices in general to rise in 2018?
United States	New York Federal Reserve Bank	What do you expect the rate of inflation/deflation to be over the next 12 months?
South Africa	Bureau for Economic Research	Over the past five years, prices increased by on average 5.4 per cent per year. During 2016, prices increased by 6.3 per cent. By about how much do you expect prices in general to increase during the next 12 months?

Table B1: *Coefficients for year fixed effects for Equation 1 and Model (5) in Table 3*

Year	(5) Model with interaction terms
2008	1.74 (0.91)+
2014	1.76 (0.73)*
2015	2.22 (0.62)***
2016	0.70 (0.66)
2017	1.62 (0.71)*
2018	1.17 (1.08)
2019	1.19 (0.98)
2020	1.42 (1.19)
2021	0.63 (1.27)
2022	0.77 (0.91)
2023	1.45 (0.77)+
2024	1.66 (0.77)*

Table B2: *Wald tests results for inclusion of interaction effects with socioeconomic characteristics*

Hypothesis tested	Wald Statistic	p-value	Conclusion
H_0 : High-mid income*FNAB inflation – Low-mid income*FNAB inflation – Low income*FNAB inflation = 0	6.229	0.01257*	Reject H_0 at 95% confidence level
H_0 : High-mid income*Brent Crude Oil price inflation – Low-mid income*Brent Crude Oil price inflation – Low income*Brent Crude Oil price inflation = 0	0.0044	0.9472	Failed to reject H_0
H_0 : High-mid income*Housing and utilities inflation – Low-mid income*Housing and utilities inflation – Low income*Housing and utilities inflation = 0	4.7047	0.03009*	Reject H_0 at 95% confidence level
H_0 : Age 25-34*FNAB inflation – Age 34-50*FNAB inflation – Age 50+*FNAB inflation = 0	0.2647	0.6069	Failed to reject H_0
H_0 : Age 25-34*Brent Crude Oil price inflation – Age 34-50*Brent Crude Oil price inflation – Age 50+*Brent Crude Oil price inflation = 0	0.1016	0.7499	Failed to reject H_0
H_0 : Age 25-34*Housing and utilities inflation – Age 34-50*Housing and utilities inflation – Age 50+*Housing and utilities inflation = 0	0.1803	0.6711	Failed to reject H_0
H_0 : Male*FNAB inflation	1.1367	0.2864	Failed to reject H_0
H_0 : Male*Brent Crude Oil price inflation	0.0065	0.9355	Failed to reject H_0
H_0 : Male*Housing and utilities inflation	0.9314	0.3345	Failed to reject H_0
H_0 : Coloured*FNAB inflation – Indian/Asian*FNAB inflation – White*FNAB inflation = 0	1.4271	0.2323	Failed to reject H_0
H_0 : Coloured*Brent Crude Oil price inflation – Indian/Asian*Brent Crude Oil price inflation – White*Brent Crude Oil price inflation = 0	0.5408	0.4621	Failed to reject H_0
H_0 : Coloured *Housing and utilities inflation – Indian/Asian*Housing and utilities inflation – White*Housing and utilities inflation = 0	0.0225	0.8808	Failed to reject H_0

*Notes: Significant levels: +=.1, *=.05, **=.01, ***=0.001. FNAB inflation is short for food and non-alcoholic beverage inflation*

Table B3: *Wald tests for testing whether coefficients are statistically different from each other*

Hypothesis tested	Wald statistic	p-value	Conclusion
Testing whether food coefficient is statistically different from food*interaction effects coefficient			
H_0 : Food and non-alcoholic beverage inflation = 0.13	0.2869	0.5922	Failed to reject the H_0
H_0 : Food and non-alcoholic beverage inflation = 0.12	0.5619	0.4535	Failed to reject the H_0
H_0 : Food and non-alcoholic beverage inflation = 0.1	1.3867	0.239	Failed to reject the H_0
Testing whether housing coefficient is statistically different from housing*interaction effects coefficient			
H_0 : Housing and utilities inflation = 0.11	0.0409	0.8397	Failed to reject the H_0
H_0 : Housing and utilities inflation = 0.14	0.1268	0.7217	Failed to reject the H_0
H_0 : Housing and utilities inflation = 0.13	0.0929	0.7605	Failed to reject the H_0

*Notes: Significant levels: +=.1, *=.05, **=.01, ***=0.001.*

Table B4: *Wald tests for testing whether coefficients are statistically different from zero, or statistically different from each other in a nonlinear model*

Hypothesis tested	**Wald statistic**	**p-value**	**Conclusion**
Testing for statistical significance of acceleration dummies			
H_0 : Accelerating Food and non-alcoholic beverage inflation = 0	31.022	0.00000002583***	Reject H_0 at the 99.9% level
H_0 : Accelerating Housing and utilities inflation = 0	23.864	0.000001042***	Reject H_0 at the 99.9% level
H_0 : Accelerating Brent Crude Oil price inflation = 0	1.7781	0.1824	Failed to reject H_0
Testing whether coefficients are statistically different from each other between flat and increasing inflation models			
H_0 : $Last\ quarter's\ aggregate\ HH\ inflation\ expectations_{flat} = Last\ quarter's\ aggregate\ HH\ inflation\ expectations_{increasing}$	0.7438453	0.3884319	Failed to reject H_0
H_0 : $Food\ and\ non-\ beverage\ inflation_{flat} = Food\ and\ non-alcoholic\ beverage\ inflation_{increasing}$	5.074601	0.0242789*	Reject H_0 at the 95% level
H_0 : $Housing\ and\ utilities\ inflation_{flat} = Housing\ and\ utilities\ inflation_{increasing}$	3.490887	0.0617075+	Reject H_0 at the 90% level
H_0 : $Brent\ Crude\ price\ inflation_{flat} = Brent\ Crude\ price\ inflation_{increasing}$	2.962524	0.0852148+	Reject H_0 at the 90% level

*Note: Significant levels: +=.1, *=.05, **=.01, ***=0.001.*