

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

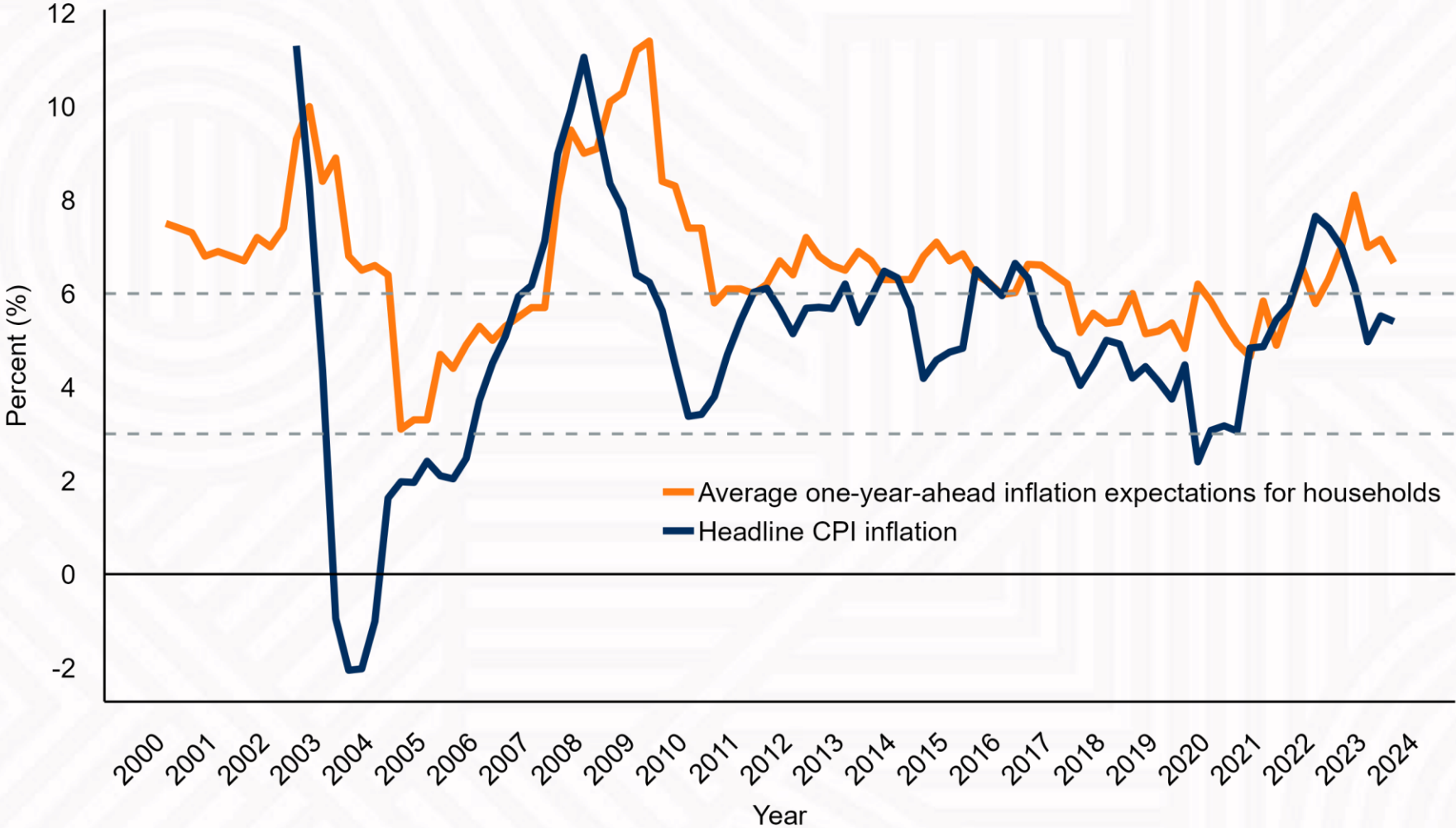
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Preliminary Findings - Please Do Not Cite

Motivation



Subjective rationality

- Traditionally, models assumed full information and rational expectations (FIRE)
- Empirically, this strict assumption rarely holds
- Gave rise to alternative methods like heterogeneous agent models (Branch, 2004)
- Poses that expectations may still be considered rational, but only when contextualised within each person's experiences and choice sets
- Weber *et al.* (2022) propose the concept of subjective inflation expectations, referring to belief-based anticipations of future inflation elicited from non-financial agents
- Subjective rationality is the combination of two concepts: rationality and subjective expectations

Saliency

- Households' inflation expectations often draw extensively on information and signals from their own economic environments
- Signals are often subject to the most salient information (de Bruin, 2011)
- Saliency -> top of mind information
 - Volatility
 - Frequency
 - Size
- Typically food, fuel and electricity prices
- Important when it comes to inflation expectations

Research plan

To assess pass-through and bias, we:

- i. Determine the proportion of each category in the expenditure basket of different income groups
- ii. Estimate the pass-through of the 3 goods that make up the largest share of the consumption basket
- iii. Evaluate whether inflation expectation sensitivity is aligned with the income share spent on those items
- iv. Evaluate whether inflation environment makes a difference in pass-through

Income and Expenditure Survey (IES)

- 2022/23, published earlier this year
- Share of expenditure spent on most crucial categories: food and transport, and housing and utilities expenditure

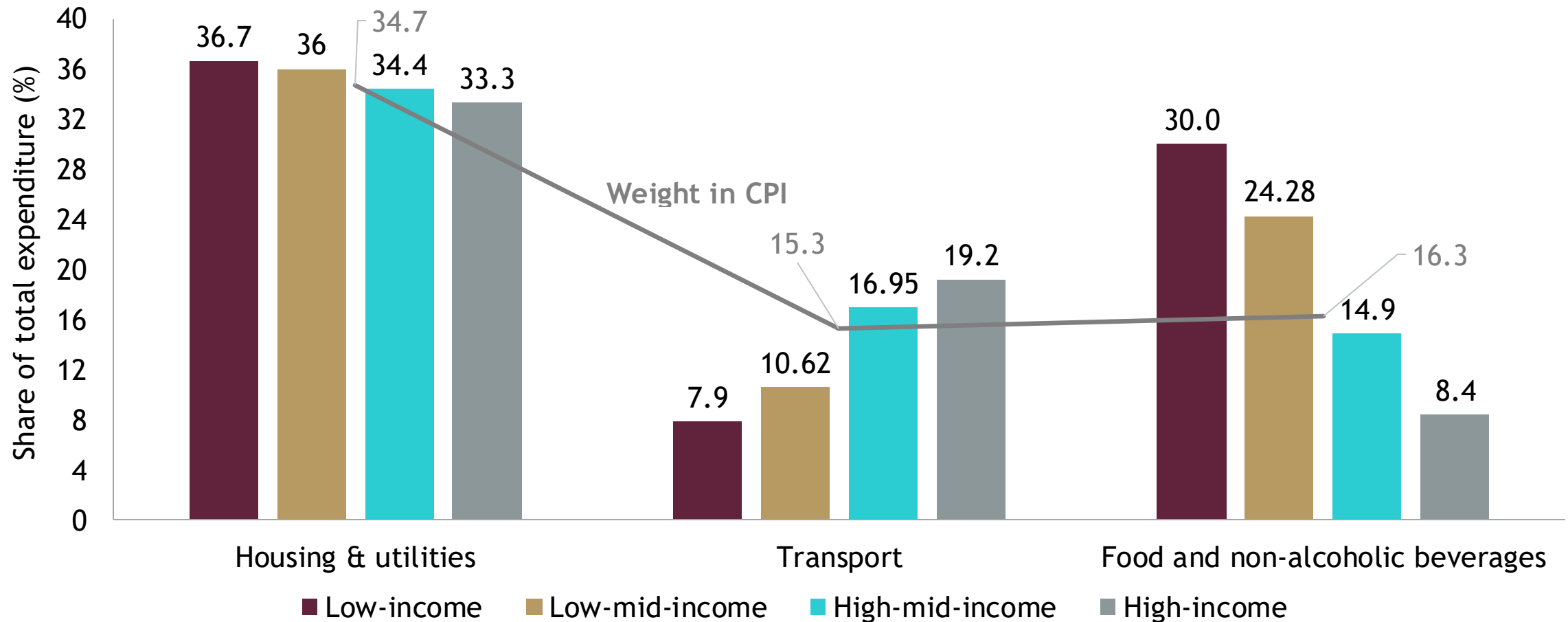
BER's household 1-year inflation expectations:

- 28 quarters of data
 - 2006Q4, 2008Q4, 2014Q4, 2015Q4, 2016Q4, 2017 2017Q4, 2018Q4, 2019Q3-Q4, 2020-2024Q1-Q3
 - Up until 2019Q3, roughly 2,000 households were interviewed in person
 - From 2019Q3 onwards, 500 households were interviewed telephonically
- 20,820 observations remain (After cleaning and excluding inflation expectations above 20%)
- Additional household socioeconomic information on: Income, Race, Gender and Age

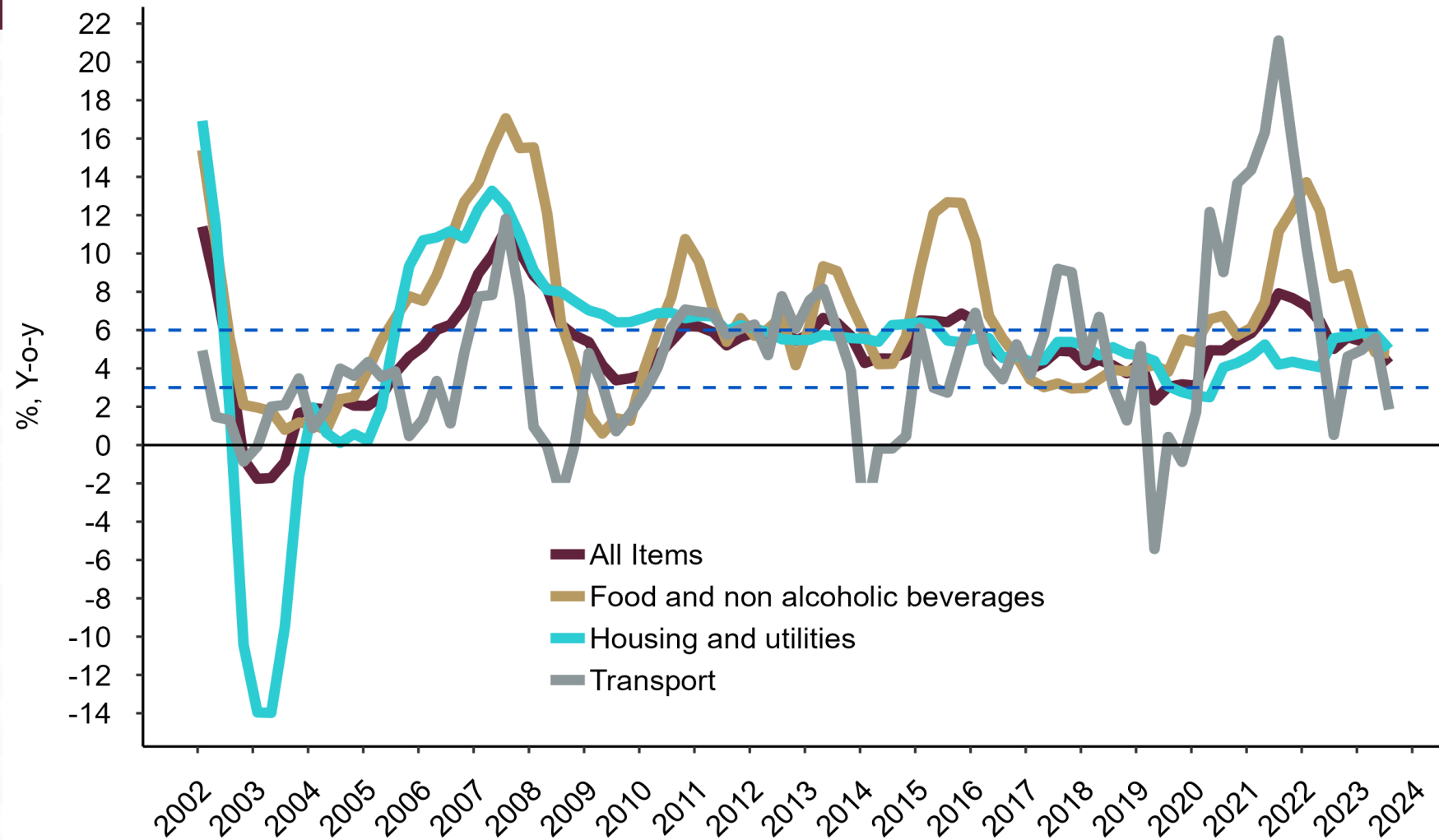
Price changes

- Stats SA CPI inflation
- Sub-indexes inflation for food, transport, and housing and utilities CPI inflation
- Other price changes such as fuel and international oil price changes obtained from *Quantec*
- % change, year-on-year

Breaking up the top three IES categories reveals that there is significant variation between income groups



South Africa's CPI inflation sub-indexes



Results

Comparison of food price pass-through to the share of food in total expenditure

- Low-income households are *under-responding* based on the share of their income spent on food
- High-income households have the highest pass-through coefficient, even though food makes the smallest share of their expenditure
- High-income and mid-income households are *overresponding* to food inflation

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

Compare housing and utilities price pass-through coefficient to share of housing in total expenditure

- Low-income households are more sensitive to housing and utilities inflation relative to higher-income groups
- The coefficients for high- and high-mid-income households are half that of low- and low-mid-income households
- All the income groups seem to be under-responding to changes in housing and utility inflation
- Possibly because housing and utilities prices are less visible and, therefore, less salient to households

	Share of housing in total expenditure (%)	Model coefficient for housing inflation pass-through	Interaction effects	Pass-through coefficient
Low-income	36.7		0.06 (0.03)	0.13
Low-mid-income	36.0		0.07 (0.03)**	0.14
High-Mid-income	34.4		0.04 (0.03)	0.11
High-income*	33.3	0.07 (0.06)		0.07

Model results - transport inflation

	(2) Simple with food and non-alcoholic beverages inflation	(3) Simple with fuel inflation	(4) Simple with oil price inflation	(5) Model with interaction terms, inflation expectations < 20)
Constant	3.86 (0.06)***	3.78 (0.06)***	4.26 (0.06)***	0.95 (0.73)
Transport CPI inflation	-0.01 (0.01)+			
Fuel (95 unleaded coastal)		-0.01 (0.00)***		
International oil price inflation			-0.01 (0.00)***	0.00 (0.00)
Other controls and interaction terms				X
Fixed effects	X	X	X	X

Asymmetry / Non-linearity

- Food price pass-through higher during period of flat inflation
- Coefficient for Brent Crude Oil inflation is the same and negligible.
- Pass-through of housing inflation is negative (-0.31) when inflation is stable, and positive (0.09) when inflation increases

	Model with 2014-2019 data (flat inflation trend)	Model with 2020-2023 data (increasing inflation trend)
Food and non-alcoholic beverage inflation	0.32 (0.12)**	0.12 (0.04)**
Brent Crude Oil inflation	-0.01 (0.01)	- 0.00 (0.00)
Housing inflation	-0.31 (0.85)	0.09 (0.09)

Contributions and Limitations

- Over-response to food inflation is present among high-income households
- Low-mid and low-income households are less sensitive to food prices than what expenditure shares suggest
- Very little to no effect of transport, fuel and international oil prices on inflation expectations
- Under-response to changes in housing and utility inflation relative to the income spent on this item
- Our results suggest that households do not form inflation expectations in a fully rational manner
- Non-linear and asymmetric responses, especially for food inflation, between stable and increasing inflation periods
 - Households are more responsive to food inflation during periods of stable headline inflation

Policy Implications

- Salient categories matter, but not in ways that are obvious
- Communication must target salient categories, especially for higher-income households
- Inflation environment makes a difference in the size of the pass-through. Salient category of food more prevalent when inflation is stable

Thank you

Questions?

Appendix



	(1) Simple with transport inflation	(2) Simple with food and non- alcoholic beverages inflation	(3) Simple with fuel inflation	(4) Simple with oil price inflation	(5) Model with interaction terms, inflation expectations < 20)
Constant	3.88 (0.06)***	3.86 (0.06)***	3.78 (0.06)***	4.22 (0.06)***	0.95 (0.73)
Food inflation	0.13 (0.01)***				
Transport CPI inflation	0.00 (0.01)	-0.01 (0.01)+			
Housing and utilities inflation	0.19 (0.01)***	0.17 (0.01)***	0.18 (0.01)***	0.06 (0.01)***	0.07 (0.06)
Food and non-alcoholic beverage inflation		0.16 (0.01)***	0.17 (0.01)***	0.19 (0.01)***	0.16 (0.02)***
Fuel (95 unleaded coastal)			-0.01 (0.00)***		
Oil inflation				-0.01 (0.00)***	0.00 (0.00)
Last quarter's aggregate HH inflation expectations					0.32 (0.07)***
Food and non-alcoholic beverage inflation × Mid income					-0.03 (0.02)
Food and non-alcoholic beverage inflation × Low income					-0.06 (0.02)**
Food and non-alcoholic beverage inflation × Low-mid income					-0.04 (0.02)+
Housing and utilities inflation × Mid income					0.04 (0.03)
Housing and utilities inflation × Low income					0.06 (0.03)*
Housing and utilities inflation × Mid income					0.07 (0.03)*
Mid income					0.05 (0.15)
Low income					0.04 (0.17)
Low-mid income					-0.23 (0.15)
Age 25-34					0.06 (0.05)
Age 34-50					0.16 (0.05)**
Age 50+					0.43 (0.06)***
Male					-0.13 (0.04)***
Coloured					0.12 (0.06)*
Indian/Asian					0.47 (0.08)***
White					0.41 (0.05)***
Summary statistics					
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

Notes: Significant levels: +=.1, *=.05, **=.01, ***=0.001. The high-income group is the reference group, Time fixed effects are not shown in this table. All of the dependent variable excludes inflation expectations above 20, except if indicated otherwise. Moreover, the Wald Test was used to test whether other interaction terms with age and gender were statistically different from zero. There was not evidence to reject the null hypothesis.