WP-2024-018

Inflation Expectations and Keeping Up With the Joneses

Taniya Ghosh and Abhishek Gorsi

Indira Gandhi Institute of Development Research, Mumbai
August 2024

Inflation Expectations and Keeping Up With the Joneses

Taniya Ghosh and Abhishek Gorsi

Email(corresponding author): taniya@igidr.ac.in

Abstract

The paper analyzes the role of personal income change and social comparisons in explaining the heterogeneity and upward bias in Indian households' inflation expectations by using repeated cross-sectional data from the Reserve Bank of India's bimonthly Consumer Confidence Survey and a one-time Primary survey. We find that when households experience a *decline* in personal income, they have higher inflation expectations, supporting the findings of Tsiaplias *(2021)(Journal Applied Econometrics, 36(6), 784–807)*. Surprisingly, contrary to Tsiaplias *(2021)(Journal Applied Econometrics, 36(6), 784–807)*, we also find that even with an *increase* in households personal income, they have higher inflation expectations. Such findings can be explained by the household's relative position and aspirations as a result of social comparisons. As household income rises, they seek higher consumption standards in order to maintain their relative position in society. The difficulty faced to attain the higher consumption level is attributed to external factors like higher prices, thus resulting in households reporting higher inflation expectations. However, when personal income falls, the relative factors have no effect on their inflation expectations. The study thus contributes to a better understanding of the behavioral factors that influence inflation expectations, the heterogeneity in household responses, and the upward bias in inflation expectations among Indian households.*expectations among Indian households.*

Keywords: Consumption Outlook, Income Outlook, Inflation, Inflation Expectations, Reference Group, Social Comparisons

JEL Code: E31, E71, *D12*

Inflation Expectations and Keeping Up With the Joneses

Taniya Ghosh* (Corresponding Author) Abhishek Gorsi†

Abstract

The paper analyzes the role of personal income change and social comparisons in explaining the heterogeneity and upward bias in Indian households' inflation expectations by using repeated cross-sectional data from the Reserve Bank of India's bimonthly Consumer Confidence Survey and a one-time Primary survey. We find that when households experience a *decline* in personal income, they have higher inflation expectations, supporting the findings of Tsiaplias (2021)*(Journal Applied Econometrics, 36(6), 784–807)*. Surprisingly, contrary to Tsiaplias (2021)*(Journal Applied Econometrics, 36(6), 784–807)*, we also find that even with an *increase* in households personal income, they have higher inflation expectations. Such findings can be explained by the household's relative position and aspirations as a result of social comparisons. As household income rises, they seek higher consumption standards in order to maintain their relative position in society. The difficulty faced to attain the higher consumption level is attributed to external factors like higher prices, thus resulting in households reporting higher inflation expectations. However, when personal income falls, the relative factors have no effect on their inflation expectations. The study thus contributes to a better understanding of the behavioral factors that influence inflation expectations, the heterogeneity in household responses, and the upward bias in inflation expectations among Indian households.

Keywords: Consumption Outlook, Income Outlook, Inflation, Inflation Expectations, Reference Group, Social Comparisons

JEL Code: E31, E71, D12

*Corresponding Author, Indira Gandhi Institute of Development Research (IGIDR), Gen. A. K. Vaidya Marg, Filmcity Road, Mumbai, 400065, India. Email: taniya@igidr.ac.in , Phone: +91-22-28426536, ORCID ID:https://orcid.org/0000-0002-9792-0967

†Indira Gandhi Institute of Development Research (IGIDR), Gen. A. K. Vaidya Marg, Filmcity Road, Mumbai, 400065, India. Email: abhishekg@igidr.ac.in, ORCID ID:https://orcid.org/0009-0001-0111-6254

1 Introduction

Central banks worldwide aim to anchor inflation expectations and use it as a policy measure (Coibion et al., 2020), emphasizing the importance of understanding the factors that affect inflation expectations. The literature has examined various factors, such as macroeconomic conditions, socio-demographic characteristics, personal shopping experience, etc., that determine inflation expectations and explain the heterogeneity in responses. Tsiaplias (2021) finds an inverse relationship between inflation expectations and changes in personal income for Australian households. Does the inverse relationship always hold? The paper revisits this relationship for the Indian data. Furthermore, the paper examines the influence of social comparisons on this relationship, elucidating the upward bias and heterogeneity in inflation expectations among Indian households.

In India, the inflation expectations are not rational and have an upward bias (Das et al., 2019). Figure 1 illustrates an upward bias in inflation expectations of the Indian households[1], which is not explained in the literature.

This paper explains the upward bias and heterogeneity in inflation expectations of the Indian households through changes in personal income and social comparisons. With a decrease in personal income of households, inline with Tsiaplias (2021), we find that their inflation expectations increase. However for India, *surprisingly*, we find that even with an increase in personal income, the inflation expectations of the households increases. The upward bias and the *anomalous* response of inflation expectations to an increase in personal income are attributed to social comparisons and households' relative positions. With an increase in their own income, the households aspire to achieve higher consumption which is reflective of their improved position in society. However, if the consumption of their peers also increases, it imposes an additional burden to further increase consumption to maintain their social position (Luttmer, 2005; Lewbel et al., 2022). An inability to maintain their relative position is blamed

[1]We find that households' quantitative expectations (blue) as captured by IESH (Inflation Expectations Survey of the Households) follow a similar pattern to urban inflation measures captured by the Consumer Price Index for Urban Areas (CPI-U) (red), but with an upward bias. The index of inflation expectations based on the CCS (green) follows a similar pattern as well. IESH is a bi-monthly survey on inflation expectations conducted by the Reserve Bank of India to capture inflation expectations of the Indian Households.

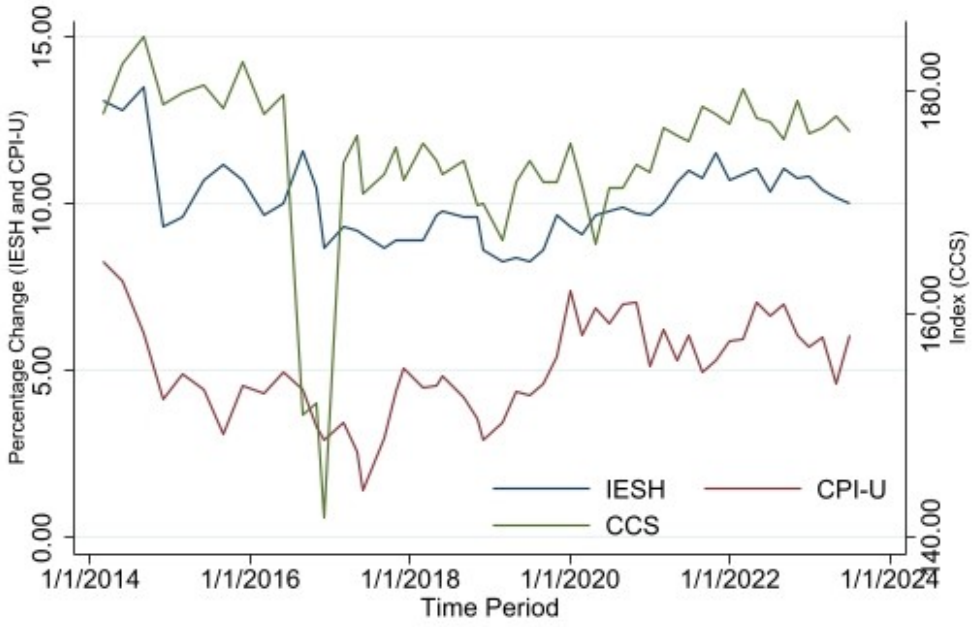

Figure 1: Upwards bias in Inflation Expectations

on external factors like higher prices, thus resulting in higher inflation expectations (Armantier et al., 2022).

This paper uses the Consumer Confidence Survey (CCS), a bi-monthly survey conducted by the Reserve Bank of India (RBI) covering 19 cities across India from March 2015 to November 2023. We construct a measure of consumption and income changes of a reference group whose consumption level the households try to attain. With a positive outlook of the reference group, the households are relatively worse off. The positive outlook of the reference group raises the consumption standard higher and the inability to achieve it is blamed on external factors resulting in higher inflation expectations.

When, however, do aspirations influence households' expectations of inflation? According to the findings, when a household experiences a positive change in their own income, they are more likely to report higher expectations of inflation with increasing income and consumption of their reference group. This is because their aspirations have become greater. However, when a household experiences a negative change in their own income, their inflation expectations are not affected by changes in the reference group's income and consumption patterns. A reference group for the household consists of peers whose consumption the household aims to

match. Lewbel et al. (2022) suggests that an increase in consumption of the reference group leads to an increase in the perceived needs of households in the context of India. When the reference group's consumption level or income rises, so does the consumption standard that the household tries to match, leaving them relatively worse off if they fail to meet that standard. As a result, inflationary expectations increase. In short, in our sample, when households income rises, so do their inflation expectations in order to keep up with the Joneses.

Since the CCS does not ask a direct question on social comparison, a cross-sectional primary survey was conducted in Nahan, Himachal Pradesh between May 27, 2024, and June 14, 2024, directly asking individuals about their relative positions compared to their peers. The findings suggest that households that are relatively worse off than their peers tend to report higher inflation expectations. The results are inline with the findings from the CCS where relative position was captured using a self-constructed measure of the reference group.

Moreover, the households that faced greater difficulty in maintaining their relative social position reported higher inflation expectations. The difficulty in maintaining the relative position is the quantitative measure of social comparisons used in the study, which households attribute to external factors such as price increases and higher inflation expectations (Armantier et al., 2022). This is one of the first studies in the literature to use such a ranking-based quantitative measure of social comparisons to examine its role in the formation of inflation expectations.

The role of rational inattention, macro-economic factors, information friction and ineffective communication have been highlighted as factors which explain the disagreement and deviation of inflation expectations from rational expectations (Carroll, 2003; Mankiw et al., 2003; Cavallo et al., 2017; Coibion et al., 2020). In addition to this, the literature has also looked at differences in inflation expectations across socio-demographic factors like education, income, gender etc. (Bruine de Bruin et al., 2010; De Bruin et al., 2011; Das et al., 2020). The inflation expectations of the households are also influenced by their shopping experiences, by price which change more frequently and have higher magnitude of change (D'Acunto et al., 2021; de Bruin et al., 2011). Moreover, personal income changes, social comparisons, and inequal-

ity have an impact on households' inflation expectations, thus explaining the heterogeneity in responses (Tsiaplias, 2021; Armantier et al., 2022; Filippin and Nunziata, 2019). Furthermore, the literature evaluates the role of social networks and peer inflation expectations on inflation expectations of the households [2]. This paper builds on previous research to highlight and understand the impact of personal income changes and social comparisons via households relative positions and aspirations on upward bias and heterogeneity in inflation expectations.

In addition to the results briefly discussed above, this paper contributes to the literature in three major ways. First, it offers a developing-economy perspective (with a focus on India). Developing economies exhibit different macroeconomic dynamics and higher output volatility compared to developed economies (Aguiar and Gopinath, 2007). In developing economies, consumption and inflation are more volatile than output, with inflation being highly persistent (Aguiar and Gopinath, 2007; Ghate et al., 2013). This impacts the inflation expectations of the households, which have an upward bias, higher disagreements, and are not rational (Das et al., 2019). This calls for a re-evaluation of factors impacting inflation expectations in an emerging economy like India.

Second, this study *'directly'* captures the impact of household aspirations and social comparisons on their inflation expectations by constructing a measure of household aspirations. This measure is based on the consumption and income outlook of a reference group, which the households attempt to match. While Tsiaplias (2021) looks at the impact of personal income changes, the author does not take into account social comparisons and aspirations of the households. Armantier et al. (2022) finds that households that are relatively worse off tend to report higher inflation expectations and attribute it to social comparisons and their aspirations. However, there are two reasons why a household may be socially worse off: first, personal income changes, and second, the household's aspirations are not met (regardless of personal income change). The qualitative measure of whether a household is better or worse off could be due to any of these factors, and it would be inappropriate to attribute being worse off solely to a failure

[2]Bailey et al. (2018) finds that social-networks impact the house price expectations, while Schoenle et al. (2023) finds inflation expectations of different US counties are influenced by the inflation expectations of other counties with strong mutual social network connections.

to meet aspirations. We find that, a positive outlook of the reference group (a measure of social comparisons and aspirations of households) has a positive effect on their inflation expectations only when they experience an increase in personal income, and not when there is a decrease in personal income.

Third, the study employs both quantitative and qualitative measures of social comparisons. It is important to consider quantitative measures because they indicate the degree of relative position. For example, suppose there are two households with comparable social positions, but one household may find it more difficult to maintain its social position than the other in the event of a negative shock. Such a household is slightly worse off than the other household. In the primary survey, households are asked to rate the difficulty they face in maintaining their relative position after a negative shock on a scale of 1 to 10. This captures the social comparisons better as it is not always in monetary terms and has other non-monetary components, for which it may be difficult to arrive at monetary equivalents [3]. The results suggests that households that find it difficult to maintain their relative position, tend to have higher inflation expectations.

Section 2 discusses the theoretical motivation, while the data and methodology is discussed in Section 3. The results and empirical findings are presented in Section 4 while Section 5 concludes the understanding of the study.

2 Theoretical Motivation

We shall consider a case where the utility of the households depends not just on their absolute consumption but also on their relative consumption. While Tsiaplias (2021) looks only at absolute consumption, we consider relative consumption to understand how does consumption of the reference group impacts the inflation expectations of the households. Following Dennis

[3] While Armantier et al. (2022) uses a quantitative approach, they use the compensation income approach. If the household is relatively worse off, it asks each household how much income would be required to be at the same level as their peers, and if they are relatively better off, how much income can they give up to remain at the same level as their peers. The compensating income approach has limitations, including inflated valuations and lack of real-world economic decisions, which may lead to inaccurate measures (Diamond and Hausman, 1994; Hausman, 2012). Bateman et al. (2002) suggests that ranking or ratings could provide better understanding of not just revealed preferences but are also more consistent with welfare approach of economics.

(2009), the utility function of the households is:

$$U(C_t, H_t, N_t) = \frac{\left(\frac{C_t}{H_t}\right)^{1-\sigma}}{1-\sigma} - \frac{N_t^{1+\varphi}}{1+\varphi} \tag{1}$$

Following Abel (1990) the relative consumption is given by:

$$H_t = \bar{C}_{t-1}^{\gamma} \tag{2}$$

where C_t is the current consumption, N_t is the labour supplied, H_t is the relative consumption, and $\bar{C}_{t-1}$ is the consumption of the reference group in previous time period. $\sigma \in (1, \infty)$ is the elasticity of consumption, which defines the curvature of the utility curve, and φ is the elasticity of labour supply to wages. This is a necessary assumption for the concavity of the utility function. The maximization problem of the households is as follows:

$$Max \;\; E_\tau \sum_{t=\tau}^{\infty} \beta^{t-\tau} \left[U(C_t, H_t, N_t)\right] \tag{3}$$

$$P_t C_t \leq W_t N_t + B_{t-1} + Q_t B_t \tag{4}$$

We maximize Equation 3 subject to Equation 4. $U(C_t, N_t, H_t)$ is the utility function of the household; P_t is the price level; W_t is the wages received at time t; and $Q_t B_t$ is the present value of the future returns of the current investment of the households. B_t is the amount received at time (t+1) from the investments made at time t. Q_t is the factor used to discount that amount to present value. The unconstrained optimization problem is the following:

$$E_\tau \sum_{t=0}^{\infty} \beta^{t-\tau} \left(U(C_t, H_t, N_t) + \lambda_t (W_t N_t + B_{t-1} - Q_t B_t - P_t C_t)\right) \tag{5}$$

The inflation expectations arrived at using the Euler equation is :

$$\pi_t^e = (\rho + r_t) + \sigma(c_t - E_t c_{t+1}) + (\sigma - 1)\gamma(\bar{c}_t - \bar{c}_{t-1}) \tag{6}$$

Where, c_t = $log(C_t)$, $\bar{c}_t$=$log(\bar{C}_t)$, h_t = $log(H_t)$ and π_t^e is the inflation expectations of the house-

holds. Since $\gamma \in [0, 1)$ and $\sigma > 1$, the coefficient of the reference group consumption growth (given by $(\sigma - 1)\gamma$) is positive. Equation 6 suggests that with an increase in consumption of the relative group ($\bar{c}_t - \bar{c}_{t-1}$), the inflation expectations would increase even when there is no change in an individual's own consumption level ($c_t - E_t c_{t+1}$). The results discussed in Section 4 suggests that when the reference groups has a positive outlook, it has a positive impact on the inflation expectations of the households.

3 Data and Methodology

The study aims to understand how personal income changes and relative position factors impact household inflation expectations. For our study, we use the secondary data from the Consumer Confidence Survey (CCS) conducted by the Reserve Bank of India (RBI) to draw broader conclusions and conducted a primary survey as well which asks households about their relative position directly.

3.1 The Consumer Confidence Survey (CCS)

The survey is conducted every two months across 19 different cities, with each round covering over 5000 individuals. The data is available from March 2015 to November 2023. All questions elicit qualitative rather than quantitative responses[4]. We pool all individual-level observations, and use an ordered logit model to understand how various factors impact inflation expectations of the individuals. Table 1 reports basic summary statistics for the CCS sample.

Here, the dependent variable is an ordinal variable, i.e. inflation expectations have lowered, remained the same, or increased. π^*_{it} is the latent variable which captures the inflation expectations of the individual *i* at time *t*. Moreover, individual responses (unobserved π^*_{it}) are modeled as a function of other variables.

$$\pi^*_{it} = X_k \beta + \epsilon_{it} \tag{7}$$

[4]Appendix A.2 discusses the survey in details

Table 1: Summary of the Data (CCS)

	Number of Observation	Percentage
Gender		
Male	1,50,694	52.34
Female	1,37,229	47.66
Income Group (Annual Income)		
Less than Rs. 1 lakh	1,11,446	38.71
Rs 1 Lakh - Rs 3 Lakh	1,36,103	47.27
Rs 3 Lakh - Rs 5 Lakh	29,367	10.2
More than Rs. 5 Lakh	11,007	3.82
Education		
Below Primary	51,853	18.01
Below Graduate	1,65,331	57.42
Graduate and Above	70,739	24.57
Occupation		
Daily Worker	27,243	9.46
Employed	69,292	24.07
Homemaker	94,273	32.74
Retired	13,928	4.84
Self Employed	54,375	18.89
Unemployed	28,812	10.01
Inflation Expectations		
Lower	12,374	5.53
Same	34,029	15.2
Higher	1,77,544	79.28
Income Expectations		
Lower	28,736	9.98
Same	1,10,359	38.33
Higher	1,48,828	51.69
Age Group		
22 Years to 29 Years	61,869	21.49
30 Years to 39 Years	80,619	28
40 Years to 59 Years	97,237	33.77
60 years and above	48,198	16.74

Source: Author's Estimation

Here, X_k is a vector of individual-specific characteristics like age, income, occupation, etc. However, the observable variable here is π^e_{it}, which is the qualitative response of individuals that depends on the latent variable (π^*_{it}) and common thresholds (α_1 and α_2).

$$\pi^e_{it} = \begin{cases} 0, & \text{if } \pi^*_{it} < \alpha_1 \\ 1, & \text{if } \alpha_1 \leq \pi^*_{it} < \alpha_2 \\ 2, & \text{if } \pi^*_{it} \geq \alpha_2 \end{cases} \tag{8}$$

Here, π^e_{it} takes the value of 0 if individuals report decreasing inflation expectations, 1 if they report unchanged inflation expectations, and 2 if they expect inflation to increase in the future. Each response has a probability attached to it. For example, the probability that an individual reports that inflation will rise over the next year is given by:

$$\text{Pr}(\pi^e_{it}=2) = \text{Pr}(\pi^*_{it} \geq \alpha_2) = \text{F}(X_k\beta - \alpha_2) \tag{9}$$

We model the F(.) function with a logit model, which ensures that the probability value remains between 0 and 1, i.e. F(-∞)=0 and F(∞)=1. The parameters are estimated using the maximum likelihood method to determine the corresponding thresholds (α_1 and α_2).

Since the question records qualitative responses about inflation expectations, an important factor to check whether it actually captures the expectations of people. We construct a measure of inflation expectations for the aggregate data (as discussed in Appendix A.3). The trends and movement of the index closely tracks the movement of quantitative inflation expectations captured in the RBI's Inflation Expectations Survey of Households (IESH). It also is positively correlated with actual inflation (CPI-U). This is also highlighted in Figure 1. With an increase in inflation (CPI-U), the number of people reporting higher inflation increases, and so do the quantitative inflation expectations.

3.1.1 Construction of the Reference Group

As previously stated, household consumption decisions are influenced by those around them, and they are also motivated by specific aspirations and social standards. Brown et al. (2015) suggests two different measures to define the reference groups:

- *Geographical Location:* the average of all other individuals in that area is considered.
- *Personal Characteristics:* individuals in the entire sample who have similar characteristics in terms of age, education, and gender are considered.

Lewbel et al. (2022) investigates the impact of such a reference group on household consumption patterns in India, discovering that an additional rupee spent by peers increases perceived need while decreasing utility by the same amount as a quarter of a decrease in own income. The approach taken here is one of spatial classification, as well as the overlap of certain characteristics in the same geographical location, such as religion, caste, and so on.

Using a similar approach, this study uses the CCS data for construction of the reference group. The CCS is conducted across different cities in India. Within each city, households are divided into different income groups based on their income levels. The reference group of a household is all other households in the city who belong to the same income category. Furthermore, the primary survey responses indicate that households compare their standard of living to their neighbours, who are typically people of similar income, as well as their colleagues and other households of similar income level.

3.2 The Primary Data

The primary survey was a cross-sectional survey conducted in the Nahan town of Himachal Pradesh between May 27, 2024, and June 14, 2024, covering 200 households. The survey was limited to urban areas in order to keep the sample similar to that of the CCS, which is conducted only in urban areas. The survey collects both qualitative and quantitative expectations of households for one year ahead. In addition, we ask households about their socio-demographic

characteristics, income changes over the last year, their relative position in society, the difficulty they face in maintaining their current standard of living, etc. Appendix A.1 provides the questionnaire used to collect information from households during the primary survey.

The respondents are asked two questions about their one-year ahead inflation expectations: a qualitative question and a quantitative question. First, *"Over the next year, what do you think will happen to inflation?"* to which they can report it will increase, decrease, or remain the same. Second, *"What do you expect the inflation level to be in the coming year? Can you provide a number for the same?"* to which they responded with a point prediction. De Bruin et al. (2012) suggests that framing of questions impacts reported expectations. When the question is about "price" and not "inflation", the respondents expectations are based on specific commodities. But, when asked about inflation expectations directly, the response is less driven by specific prices. Since the objective is to understand the impact of relative factors on inflation expectations, accounting for such question framing biases, the survey directly asks households about their inflation expectations. This is comparable to the one asked in the CCS conducted by the RBI, discussed in the previous subsection, which asked households about both inflation and price expectations.

In addition, we ask them directly about their relative position in society, i.e. if they think they are better-off or worse-off compared to their peers. Furthermore, we ask them to rate the difficulty they would face maintaining the same relative position given the inflation level[5] is at 10% or 15%. The households rate the difficulty on a scale of 1 to 10, with 1 indicating no difficulty at all and 10 indicating extreme difficulty in maintaining the relative position. This provides a quantitative measure of the difficulty faced by households in maintaining a comparable relative position in society. A household may have a comparable standard of living to their peers, but they may not be as prepared to deal with a price or negative income shock as their peers are. This makes such households more vulnerable and exposed, potentially affecting their ability to maintain a comparable standard of living, as well as their expectations and outlook. Table 2

[5]The Inflation Expectations Survey of Households (IESH) reports that the average one-year ahead inflation expectations of households was around 10% for the two survey rounds conducted in January and March 2024. So, we take 10% as one measure and take another measure of higher inflation, i.e. 15%.

summarises the composition of the households surveyed in the primary survey[6].

3.3 Empirical Approach

As discussed earlier, we will be using an ordered logit model. The dependent variable here is inflation expectations of the households over the next year. The objective is to understand how households personal income changes affect their inflation expectations. Furthermore, how does the reference group's income outlook impact their inflation expectations. In addition to these variables of interest (i.e., own income change and changes in the outlook of reference groups), we control for other socio-demographic factors such as age, education level, occupation, income level, etc. These are the factors used to explain the heterogeneity in inflation expectations among households.

$$\pi^*_{it} = \beta_0 + \beta_1 * \Delta Y^e_{it} + \beta'_2 * M_{it} + \beta'_3 * X_{it} + \beta_4 * Ref_{it} + \beta_5 * (\Delta Y^e_{it} * Ref_{it}) + \theta_t + \epsilon_{it} \quad (10)$$

Here, Y^e_{it} represents households's own income expectations, while M_{it} is a vector containing information about their expectations of macroeconomic conditions, such as economic condition and employment. Ref_{it} is an index of reference groups' income or consumption expectations, and X_{it} is the vector of socio-demographic controls, which include age, city, education level, income group, occupation, household size, and number of earning members. Also, θ_t is the time-fixed effect, which controls for variations in each round. This is the overall framework, and we use different specifications of Equation 10.

In Equation 10, an interaction term between own income change and reference group outlook is considered. The reference group outlook is a continuous variable, whereas own income change is a categorical variable (i.e., decrease in income, same level of income, or increase in

[6]The CCS survey (Table 1) had 52% male respondents, while the primary survey (Table 2) had around 56% male respondents. In the CCS sample, 18% of respondents only studied up to the primary level, compared to 14% in the primary survey. The CCS survey sample shows that approximately 79% of households expect inflation to rise. The primary survey sample shows that approximately 71% of households expect inflation to rise. This suggests that the composition of the survey is similar and comparable.

Table 2: Summary of the Data (Primary Survey)

	Number of Observations	Percentage
Gender		
Male	113	56.5
Female	87	43.5
Income Groups		
Less than Rs. 3 Lakhs	59	29.5
Rs. 3 Lakhs - Rs. 6 Lakhs	44	22
Rs. 6 Lakhs - Rs. 9 Lakh	25	12.5
Rs. 9 Lakhs - Rs. 12 Lakh	23	11.5
Rs. 12 Lakhs - Rs. 15 Lakh	11	5.5
Above Rs. 15 Lakh	38	19
Education		
Below Primary	29	14.5
Below Graduate	69	34.5
Graduate and above	102	51
Occupation		
Daily Worker	59	29.5
Homemaker	22	11
Employed	97	48.5
Self Employed	20	10
Unemployed	2	1
Inflation Expectations		
Lower	12	6
Same	45	22.5
Higher	143	71.5
Income Change		
Lower	11	5.5
Same	120	60
Higher	69	34.5
Relative Position		
Worse-Off	56	28
Same	81	40.5
Better-Off	63	31.5
	Mean	Std Dev
Age	36.4	11.5
Family Size	4.9	1.8
Inflation Expectations	9.4	4.2
Difficulty (High)	6.7	1.9
Difficulty (Low)	5.6	1.9

Note:
Difficulty refers to difficulty faced by households in maintaining their relative position in case of a inflation shock.
Source: Author's Estimation

income). Assume the equation with the interaction term is as follows:

$$\pi^*_{it} = \beta_0 + \beta_1 * \text{Ref}_{it} + \beta_2 * \text{Increase in Income}_{it} + \beta_3 * \text{Decrease in Income}_{it}$$
$$+\beta_4 * (\text{Increase in Income}_{it} * \text{Ref}_{it}) + \beta_5 * (\text{Decrease in Income}_{it} * \text{Ref}_{it}) + \epsilon_{it} \quad (11)$$

To determine the marginal effect of the reference group on inflation expectations of the household, we differentiate Equation 11 with Ref_{it}, which gives us:

$$\beta_1 + \beta_4 * \text{Increase in Income}_{it} + \beta_5 * \text{Decrease in Income}_{it} \quad (12)$$

So, in case of an increase in own income, the marginal effect of increase in reference group outlook is given by $\beta_1 + \beta_4$, while in case of a decrease in own income, the marginal effect of increase in reference group outlook is given by $\beta_1 + \beta_5$.

4 Empirical Results

The results section is divided in three subsections. The first sub-section uses CCS data, and the results suggest that a decrease and increase in personal income increase inflation expectations. Moreover, with an increase in income and consumption of the reference group, households' inflation expectations also increase. The heterogeneity in response to changes in the reference group's income or consumption change is also explored, where households that have experienced a positive income change are more impacted by the relative measures. The results are robust to different measure of reference groups outlooks, inflation expectations measures and alternate construction of reference group as discussed in the second sub-section.

The third sub-section discusses the findings from the primary survey, which show that households who are worse off than their peers and believe they will fare worse in the event of an inflationary shock tend to report higher inflation expectations.

4.1 The Findings from the Consumer Confidence Survey (CCS)

This sub-section employs the CCS to generalize the impact of factors like personal income changes and relative positions on inflation expectations in India. Because the CCS does not directly ask about households' relative positions, an artificial measure is created. A household's reference group is made up of households whose standard of living they want to match. Therefore, a household's reference group is made up of all households in the same city and income group at a given time. Since the CCS only reports a qualitative measure, a quantitative[7] measure for the reference groups outlook is arrived at as discussed in Appendix A.3. This provides a measure of both personal income changes and changes in income or consumption for the reference group. If more households in the reference group have a positive outlook on income or consumption, the household's relative position will fall. When more households experience an increase in income or consumption, it raises the previous standard of living, which has a negative impact on their relative position. As a result, they must adjust to new and higher social standards, which exacerbates their relative situation. This section examines the effect of reference groups' income and consumption outlooks on household inflation expectations.

Table 3 discusses the impact of personal income change and reference groups' outlook on households inflation expectations while controlling for other factors like macro-economic expectations, age, education, etc. The results (Table 3 Panel B, Column 2 and Column 5) indicate that when households experience a decline in personal income, they are more likely to report elevated inflation expectations compared to a scenario with no change in personal income, consistent with Tsiaplias (2021). However, in contrast to Tsiaplias (2021), which suggests that an increase in personal income should lead to a decrease in inflation expectations, our findings indicate that households experiencing an increase in their income are 6% more likely to report higher inflation expectations. This is one of the factors that explains the upward bias in inflation expectations among Indian households.

[7]The index value of the reference group's consumption and income outlook ranges from 0 to 200. Here, 0 indicates that all members of the reference group have a negative outlook, 100 indicates a neutral outlook, and 200 indicates a positive outlook.

Table 3: Findings from the CCS

	(1)	(2)	(3)	(4)	(5)	(6)
	Reference Group: Consumption Outlook			Reference Group: Income Outlook		
Panel A						
Reference Group	**0.006*****	**0.006*****	**0.004*****	**0.001****	**0.003*****	**0.001**
	(0.001)	**(0.001)**	**(0.001)**	**(0.001)**	**(0.001)**	**(0.001)**
Panel B						
Decrease in Own Income		0.105***	0.617**		0.108***	0.312
		(0.020)	(0.194)		(0.020)	(0.170)
Increase in Own Income		0.067***	-0.504***		0.063***	-0.744***
		(0.012)	(0.115)		(0.012)	(0.107)
Panel C						
Decrease in Own Income *			**-0.003****			**-0.002**
Reference Group			**(0.001)**			**(0.001)**
Increase in Own Income *			**0.003*****			**0.006*****
Reference Group			**(0.001)**			**(0.001)**
Panel D						
Negative Economic Outlook		0.246***	0.244***		0.249***	0.247***
		(0.017)	(0.017)		(0.017)	(0.017)
Positive Economic Outlook		0.012	0.010		0.012	0.010
		(0.015)	(0.015)		(0.015)	(0.015)
Negative Employment Outlook		0.384***	0.383***		0.387***	0.385***
		(0.017)	(0.017)		(0.017)	(0.017)
Positive Employment Outlook		-0.030*	-0.031*		-0.030*	-0.031*
		(0.015)	(0.015)		(0.015)	(0.015)
Socio Demographic	✓	✓	✓	✓	✓	✓
N	223946	223946	223946	223946	223946	223946
Chi-Square	11681.59	13800.04	13845.44	11511.48	13664.30	13739.11
Pseudo R-Squared	0.041	0.049	0.049	0.041	0.048	0.049

Note:
Standard errors are reported in the parentheses.
* ($p<0.05$), ** ($p<0.01$), *** ($p<0.001$)
Socio-Demographic Controls: Age, Education, Income, Occupation, Family Size, Earning Members and Gender
The Chi-Square Statistics reject the Null-hypothesis that at least one of the variables is
significantly different from zero at the 1% level of significance.
The McFadden pseudo-R-Square provides a measure of goodness of fit as apposed to a null model
(i.e. a model with only an intercept term.)
Source: Authors Estimation

What explains this contrasting behaviour? We hypothesise that, with an increase in income, the desired consumption and social status the households wish to achieve increases, and the inability to further improve their relative position is attributed to external prices. This results in higher inflation expectations. We introduce the income and consumption outlook of the reference group as a measure of household aspirations. It also indicates about the relative position of the household, as even if personal income increases, the relative position of the household as compared to their peers may not improve if the peers income and consumption also increase.

According to Table 3, if 1% more households in the reference group report a net positive consumption outlook (see Column 1 in Panel A), the household is 0.6% more likely to report higher inflation expectations. And if 1% more households in the reference group report a net positive income outlook (see Column 4 in Panel A), the household is 0.1% more likely to report higher inflation expectations. While the qualitative impact of income and consumption outlooks is comparable and similar across different models, the magnitude of consumption outlook is greater. When more households have a positive consumption outlook, overall consumption will rise. As a result, the household must increase their consumption in order to maintain their current relative position, as the reference group's consumption level rises. Households perceive their inability to increase consumption due to budget constraints as higher inflation in the economy. Thus, even if a households have a positive income outlook, they may suffer if the reference group's income and consumption rise faster than theirs. These results are inline with Armantier et al. (2022), who suggest that when the households are relatively worse off, they tend to have higher inflation expectations.

In Table 3 (Panel C), Columns 3 and 6 include interaction terms between the household's own income change and the outlook of the reference group. This helps in understanding how the impact of reference groups and relative factors varies with own income changes of the households. The broad understanding from the exercise is that households with a positive change in their own income are more impacted by the relative position and outlook of the reference groups.

If the household experience a positive (negative) change in income, then for 1% increase in net positive responses of the reference groups consumption outlook (Table 3 Column 3) the households are 0.7% (0.1%) more likely to report higher inflation expectations [8]. This suggests that households experiencing a positive income change are more impacted by relative factors as compared to other households. Similarly, when the income outlook of the reference group (Table 3 Column 6) is considered, it suggests that for a 1% increase in the net positive income outlook of the reference group, households who experienced an increase in income are 0.7% more likely to report higher inflation expectations, while it has no significant impact on households that experience a negative change in their own income. With an increase in own income, the household wishes to improve their relative position in society. However, if their peers also increase their consumption, the desired consumption level and social position of the households, shifts upwards. The inability to match the new desired level of consumption is associated with external factors like higher prices etc., thus resulting in higher inflation expectations.

Moreover, Table 3 reports the impact of households' macroeconomic expectations on their inflation expectations, in addition to changes in own income and the reference group's outlook. Households with a negative future economic outlook (negative employment outlook) are 27% (46%) more likely to report higher inflation expectations than those with a neutral future outlook. Households with a positive employment outlook are 3% less likely to expect higher inflation than those with a neutral outlook. Inflation expectations are not significantly different between households with a positive and neutral future economic outlook. These findings are consistent with the behavioral observation that households that are pessimistic about future outcomes expect higher inflation. Asymmetry is also observed in this case, as households that are pessimistic about the future economic outlook have higher inflation expectations, whereas households with an optimistic outlook do not necessarily have lower inflation expectations.

[8] Equations 11 and 12 show that the impact of the reference group varies depending on the increase or decrease in own income. The impact of an increase in own income is given by β_1+β_4, i.e. 0.004+0.003=0.007, which suggests that households with a positive income change are 0.7% more likely to report higher inflation expectations when there is a 1% net positive increase in the reference group's outlook. In the case of a decrease in own income, the marginal effect is given by β_1+β_5, i.e. 0.004-0.003=0.001, implying that the marginal effect is only 0.1%. In the absence of income change, the marginal effect is only $\beta_1 = 0.004$, indicating a 0.04% higher likelihood.

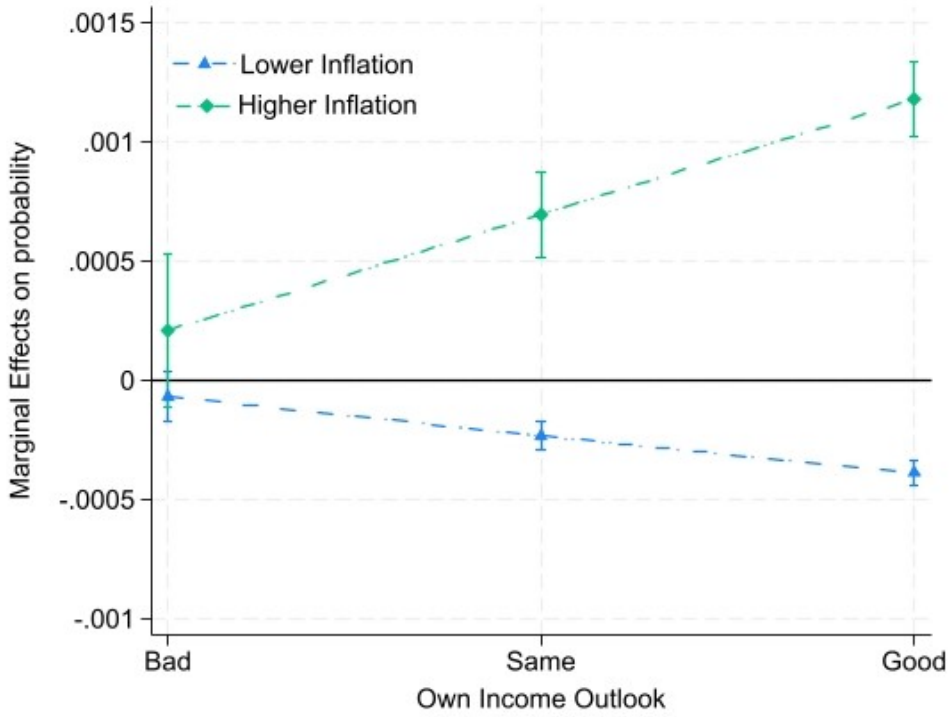

Figure 2: Marginal Impact of Reference Group Consumption Outlook on Inflation Expectations

Figure 2 plots the marginal effect of the reference group's consumption outlook on household inflation expectations for different cases of changes in their own income following Equations 11 and 12. If the marker and confidence interval are above the zero line, it indicates a significantly positive marginal effect; if they are below the zero line, it indicates a significantly negative marginal effect. If the confidence interval contains the zero line, it indicates that there is no significant impact. The green (blue) marker is the marginal effect of an increase in the reference group's consumption outlook on households reporting higher (lower) inflation.

When a household's income rises (good on the x-axis), they are more likely to report higher inflation (green marker) and less likely to report lower inflation (blue marker). With an increase in the reference group's outlook, if household income remains unchanged (same on the x-axis), they are more likely to report higher inflation (green marker) and less likely to report lower inflation (blue marker). It also suggests that the marginal effect of reference group outlook is greater for households that experienced an increase in income as compared to those whose income remained the same. In households that experienced a negative change in their own income (bad on x-axis), the reference group outlook has no significant effect on whether they

report higher or lower inflation expectations.

Therefore, household inflation expectations are driven by aspirations, and the reference group's consumption and income changes, only when they maintain their own income level or experience an increase in their own income. Thus, it also becomes important to look at the role of aspirations and social comparisons in determining the inflation expectations of the households.

4.2 Robustness Checks

This section discusses the robustness of the results found using the CCS data. The findings are consistent with other measures of inflation expectations, such as inflation perceptions, price outlook, etc. Furthermore, the results are consistent with both the current outlook (i.e. changes in income, consumption, etc. over the past year) and the future outlook (i.e. changes in income consumption, etc. over the next year) of the reference group. The reference group is constructed using a different approach, in which households with similar characteristics from the previous time period are considered rather than the current time period.

Table 4: Alternate Measure of Inflation Expectations

	Inflation Perception		Price Outlook		Price Perception	
	(1)	(2)	(3)	(4)	(5)	(6)
Reference Group	0.003***		0.005***		0.003***	
(Income Outlook)	(0.001)		(0.001)		(0.001)	
Reference Group		0.008***		0.018***		0.025***
(Consumption Outlook)		(0.001)		(0.001)		(0.001)
Socio Demographic	✓	✓	✓	✓	✓	✓
N	252514	252514	287922	287922	287922	287922
Chi Square	13376.77	13636.86	6938.07	10108.37	16017.19	20160.58
Pseudo R squared	0.047	0.048	0.018	0.026	0.063	0.079

Note:
Standard errors are reported in the parentheses.
* ($p<0.05$), ** ($p<0.01$), *** ($p<0.001$)
Socio-Demographic Controls: Age, Education, Income, Occupation, Family Size, Earning Members and Gender. It also controls for own income and macroeconomic expectations of the households.
Source: Authors Estimation

4.2.1 Different Measures of Inflation Expectations

Table 4 discusses the impact of reference group outlook on alternate measures of inflation expectations. While the earlier discussion used the one year ahead inflation expectations of households, this section considers three alternative proxies of inflation expectations. First, it uses inflation perceptions, i.e. how has inflation changed over the past year (see Table 4 Columns 1 and 2). Second, it uses the price outlook, i.e. how prices will change over the next year (see Table 4 Columns 3 and 4) and finally, it uses current price perceptions (see Table 4 Columns 5 and 6). It is found that these measures, inflation perceptions and price outlook, are highly correlated with inflation expectations, and households with higher inflation perceptions tend to have higher inflation expectations.

The findings are consistent with the earlier findings that households report higher inflation expectations when the reference group's outlook is more positive. Furthermore, the findings indicate that an increase in reference group outlook not only raises households inflation expectations, but also influences how they perceive current inflation and price changes. If 1% more people have a net positive income outlook in the reference group, then the household is 0.3% more likely to report higher perceived inflation (see Table 4 Column 1). The magnitude of the impact increases when, instead of the income outlook of the reference group, the consumption outlook of the reference group is considered. For every 1% increase in net positive response in consumption outlook in the reference group, the household is 0.8% more likely to report higher perceived inflation (see Table 4 Column 2).

4.2.2 Different measures of Reference Groups

Table 5 shows how different measures of reference group income and consumption affect inflation expectations. The different columns present the different models, where the explanatory variable (variable of interest) changes. The dependent variable, namely inflation expectations, remain the same across all different models. Table 3 shows how the reference group's income and consumption outlook, a measure of household aspirations, affects inflation expectations.

Table 5: Different Measures of Reference Groups Outlook (Aspirations)

	Current Perception				Future Outlook	
	Income	Consumption	Consumption Essential	Consumption Non-Essential	Consumption Essential	Consumption Non-Essential
	(1)	(2)	(3)	(4)	(5)	(6)
Inflation Expectations	0.003*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.002*** (0.001)	0.005*** (0.001)	0.003*** (0.001)
Socio Demographic	✓	✓	✓	✓	✓	✓
N	223946	223946	223946	223946	223946	223946
Chi Square	12440.77	12546.53	13711.74	13654.22	13702.74	13750.42
Pseudo R squared	0.044	0.044	0.049	0.048	0.049	0.049

Note:
Standard errors are reported in the parentheses.
* (p<0.05), ** (p<0.01), *** (p<0.001)
Socio-Demographic Controls: Age, Education, Income, Occupation, Family Size, Earning Members and Gender. It also controls for own income and macroeconomic expectations of the households.
Source: Authors Estimation

In Table 5 , in addition to the reference group's future outlook, the current perception of the reference group about their income change (Table 5 Column 1) and consumption (Table 5 Column 2) is considered. The results are qualitatively the same, i.e., when the reference group has a more positive outlook or perception of income or consumption, it increases households' aspirations, and thus they are more likely to report higher inflation.

In addition, Table 5 (Column 3–4) considers the dis-aggregation of consumption as essential and non-essential consumption. The results are qualitatively the same, i.e., when the reference group has a positive outlook towards essential (see Table 5 Column 5) and non-essential consumption (see Table 5 Column 6), households are more likely to have higher inflation expectations. When the reference group's consumption rises, so do the household's aspirations or consumption standards. If they are unable to reach the desired level, they blame external factors such as rising inflation. Thus, households have significantly higher inflation expectations. Note that the increase in the outlook of essential goods consumption of the reference group (Table 5 Columns 3 and 5) has a greater impact than non-essential (Table 5 Columns 4 and 6). This is consistent with Lewbel et al. (2022), which suggests that an increase in essential consumption by peers leads to higher perceived household needs.

4.2.3 Changing the Reference Group

In this section, the reference group of the household consists of households that live in the same city and belong to the same income group but were surveyed in the previous round of the survey. While discussing the main results (Table 3), the reference group consisted of households who live in the same city and belong to the same income group, and the households were surveyed at the same time. The households can observe the consumption and income changes of the reference group better with a lag.

Table 6: Alternate Construction of Reference Group

	Reference Group Outlook		Reference Group Perception	
	(1)	(2)	(3)	(4)
Reference Group (Income)	0.003*** (0.001)		0.003*** (0.001)	
Reference Group (Consumption)		0.005*** (0.001)		0.004*** (0.001)
Decrease in Own Income	0.193*** (0.020)	0.192*** (0.020)	0.192*** (0.020)	0.191*** (0.020)
Increase in Own Income	0.007 (0.012)	0.010 (0.012)	0.011 (0.012)	0.014 (0.012)
Socio Demographic	✓	✓	✓	✓
N	223946	223946	223946	223946
Chi Square	12433.29	12554.57	12440.18	12524.81
Pseudo R squared	0.044	0.044	0.044	0.044

Note:
Standard errors are reported in the parentheses.
* (p<0.05), ** (p<0.01), *** (p<0.001)
Socio-Demographic Controls: Age, Education, Income, Occupation, Family Size, Earning Members and Gender
Source: Authors Estimation

Table 6 shows how changes in reference group income (Columns 1 and 3) and consumption (Columns2 and 4) affect household inflation expectations. Here, the reference group is made up of households surveyed in the previous round. With a 1% net positive response in income outlook of the reference group (Table 6 Column 1), the household is 0.3% more likely to report higher inflation expectations. Similary, if the reference group has a 1% net positive outlook towards consumption, the household is 0.5% more likely to have higher inflation expectations. The results are qualitatively the same when income (Table 6 Column 3) and consumption (Table

6 Column 4) perceptions of the reference group are considered rather than their future outlook.

4.3 The Findings from the Primary Survey

This sub-section discusses how households' inflation expectations vary in response to changes in personal incomes and living standards, as captured by qualitative and quantitative measures of relative position. First, it compares average inflation expectations across income changes and relative positions. Second, it uses ordinary least squares (OLS) regression and an ordered logit model to understand the impact of relative factors on inflation expectations while controlling for other socio-demographic factors like age, education, income, etc.

Table 7 presents the average inflation expectations of households for an increase, decrease, or no change in income level and their self-reported relative position in society, i.e., better-off, worse-off, or the same as when compared to others. The results (Table 7 Total Population Column) suggest that households that experienced an increase in income report on average lower inflation expectations (8.25%) than households that do not experience any change in income (9.65%) and those who report a decrease in income (13.55%). These results are consistent with Tsiaplias (2021). However, when the households are relatively worse off (Column Worse-off in Table 7), the average inflation expectations of the households when they experience an increase in income (12.33%) and a decrease in income (13.67%) are both higher than when there is no change in income(12.09%). This is inline with our earlier result that when if the households is relatively worse-off, they report higher inflation even if there is an increase in personal income. Also, on average, households that are better-off compared to their peers have lower inflation expectations (7.25%) when compared to households that have a similar standard of living (8.9%) and households who are relatively worse off (12.48%) than their peers (Table 7 Row Total Population). These findings are in line with Armantier et al. (2022), where households who think that they are better-off compared to others have on average lower inflation expectations, while households who think that they are worse-off tend to have higher inflation expectations.

Even if a household has a similar standard of living as their peers, they may struggle to maintain the same relative position during a negative shock. The current relative position (i.e.,

Table 7: Average inflation expectations for income change and relative position

Own Income Change	Relative Position			Total
	Better Off	Same	Worse-Off	Population
Increase	7.23	8.28	13.33	8.25
Same	7.25	9.12	12.09	9.65
Decrease	8	18	13.67	13.55
Total Population	7.25	8.90	12.48	9.38

Source: Author's Estimation

being better-off or worse-off) does not capture the difficulty faced in maintaining the same relative standard of living. In contrast to Armantier et al. (2022), who uses compensating income approach to understand the extent of being better-off or worse-off, respondents of the primary survey were asked to rate the level of difficulty they face in maintaining their relative position in society. According to Bateman et al. (2002), ratings, unlike compensating income, do not inflate valuations and offer a better understanding of comparisons. So, on a scale of 1 to 10, households rate the difficulty of maintaining their relative position in comparison to their peers. Households that struggle to maintain their relative position or believe they will be worse off than their peers in the event of an inflationary shock are more vulnerable and may be classified as relatively worse-off.

Figure 3 depicts households' inflation expectations (y-axis) and difficulties in maintaining their relative position in society (x-axis). The red line depicts a linear estimate of inflation expectations as a function of the difficulty of maintaining the relative position. The upward sloping curve suggests that as the difficulty of maintaining one's relative social position increases, so do inflation expectations.

Table 8 examines how households' inflation expectations are affected by their relative position, while controlling for other socio-demographic factors such as age, education, and so on. Columns 1–3 show the results of OLS regression using quantitative inflation expectations, while columns 4–6 show the results of the ordered logit model using qualitative inflation expectations. Columns 1 and 3 only use a quantitative measure of relative position or standard of living, that is, the difficulty households face in maintaining their relative position on a scale of 1 to 10. Columns 2 and 5 only use qualitative classifications of relative position, such as

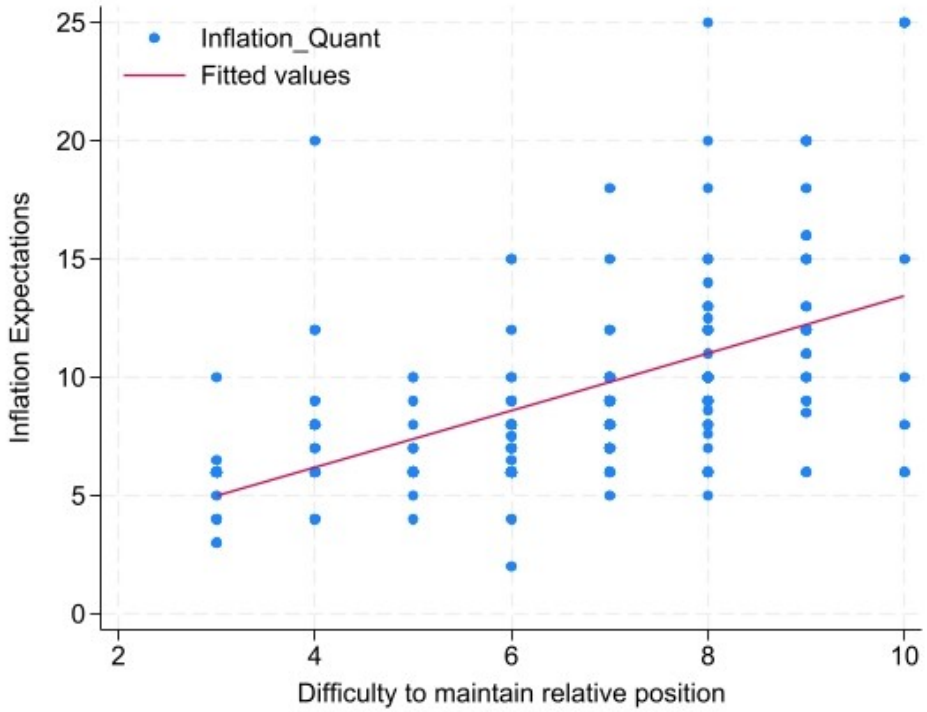

Figure 3: Impact of Relative Position on Inflation Expectations

better or worse off. Column 3 and Column 6 use both qualitative and quantitative measures of the relative position of the household. The findings suggest that households whose relative position is not good tend to report higher inflation expectations.

The OLS estimation results (Table 8 Column 1) show that for every one unit increase in difficulty faced by households to maintain their relative position, their inflation expectations increase by 1.16%. When we control for changes in personal income and relative social standing as reported by households, the results are qualitatively similar. In this case (Table 8 Column 3), households' inflation expectations increase by 0.97% with each unit increase in difficulty level. In Table 8, Column 2, we find that individuals who are worse off than their peers have 3.07% higher inflation expectations, while households who are better off have 1.39% lower inflation expectations on average. The adjusted R-squared value of 0.34 (Table 8 Column 3) suggests that 34% of the variation in inflation expectations of the households is explained by the above specified model.

Table 8: Findings from Primary Survey

	(1)	(2)	(3)	(4)	(5)	(6)
		OLS			Ordered Logit	
Relative Position (Quantitative)	**1.158***** **(0.162)**		**0.972***** **(0.185)**	**1.05***** **(0.161)**		**0.909***** **(0.171)**
Decrease in Own income			1.434 (1.205)			0.279 (1.455)
Increase in Own income			0.171 (0.60)			-0.572 (0.46)
Relative Position Better Off		-1.389* (0.538)	-0.156 (0.605)		-1.688*** (0.445)	-0.824*** (0.52)
Relative Position Worse Off		3.068*** (0.814)	1.895* (0.744)		1.611*** (0.601)	0.564*** (0.678)
Constant	-0.623 (2.069)	7.04*** (1.698)	-0.531 (2.165)			
Socio Demographic	✓	✓	✓	✓	✓	✓
N	200	200	200	200	200	200
Adj. R Squared	0.324	0.254	0.343			
F Statistic	6.972***	4.989***	6.203***			
Pseudo R squared				0.261	0.151	0.283
Chi Square				77.6***	44.85***	84.11***

Note:

Standard errors are reported in the parentheses.

* ($p<0.05$), ** ($p<0.01$), *** ($p<0.001$)

Socio-Demographic Controls: Age, Education, Income, Occupation, Family Size, Earning Members and Gender

The F-Stat and Chi-Square Statistics reject the Null-hypothesis that at least one of the variables is significantly different from zero at the 1% level of significance.

The adjusted R square provides a measure of goodness of fit for the linear regression, while the (McFadden) Pseudo R-Square which provides a measure of goodness of fit as apposed to a null model (i.e. a model with only an intercept term.)

Source: Authors Estimation

The results from the ordered logit model are qualitatively similar. According to the results (Table 8 Column 6), households with higher difficulty levels are more than twice as likely to report higher levels of inflation. We find that household inflation expectations are significantly influenced by social comparisons and relative position, even after controlling for individual own income changes.

5 Conclusion

Globally, central banks are focusing on anchoring inflation expectations and promoting it as a stabilization policy. Thus, it becomes important to understand the different factors which impact inflation expectations. The findings of the study suggests that personal macroeconomic expectations, personal income changes, and consumption and income outlook of others impact the inflation expectations of households. The study's major findings are summarized below: First, social comparisons has a role to play, as households that are worse-off tend to report higher inflation expectations. Second, households that experience a fall in personal income tend to report higher inflation expectations. Third, households that experience an increase in personal income are more affected by changes in their reference group's income. Fourth, macroeconomic expectations have an asymmetric impact; negative expectations about the general economic condition and employment scenario lead to households reporting higher inflation expectations, whereas a positive outlook does not always imply reporting lower inflation expectations.

These findings contribute to understanding the upward bias and heterogeneity in inflation expectations in India, as when personal income falls, households are more likely to have higher inflation expectations. However, even when households' incomes rise, if their reference group's consumption rises, so does their desired consumption level in order to keep up with the Joneses. If households are not able to fulfil their aspirations of higher consumption, they attribute this inability to higher prices.

References

Abel, A. B. (1990). Asset Prices under Habit Formation and Catching up with the Joneses. *The American Economic Review*, 80(2):38–42. Publisher: American Economic Association.

Aguiar, M. and Gopinath, G. (2007). Emerging market business cycles: The cycle is the trend. *Journal of Political Economy*, 115(1):69–102.

Armantier, O., Filippin, A., Neubauer, M., and Nunziata, L. (2022). The expected price of keeping up with the Joneses. *Journal of Economic Behavior & Organization*, 200:1203–1220.

Bailey, M., Cao, R., Kuchler, T., and Stroebel, J. (2018). The economic effects of social networks: Evidence from the housing market. *Journal of Political Economy*, 126(6):2224–2276.

Bateman, I., Carson, R., Day, B., Hanemann, M., Hanley, N., Hett, T., Jones-Lee, M., Loomes, G., Mourato, S., Ozdemiroglu, E., Pearce, D., Sugden, R., and Swanson, J. (2002). *Economic Valuation with Stated Prederence Techniques - A Manual*. Edward Elgar Publishing.

Brown, S., Gray, D., and Roberts, J. (2015). The relative income hypothesis: A comparison of methods. *Economics Letters*, 130:47–50.

Bruine de Bruin, W., Vanderklaauw, W., Downs, J. S., Fischhoff, B., Topa, G., and Armantier, O. (2010). Expectations of inflation: The role of demographic variables, expectation formation, and financial literacy. *Journal of Consumer Affairs*, 44(2):381–402.

Carroll, C. D. (2003). Macroeconomic expectations of households and professional forecasters. *The Quarterly Journal of Economics*, 118(1):269–298.

Cavallo, A., Cruces, G., and Perez-Truglia, R. (2017). Inflation expectations, learning, and supermarket prices: Evidence from survey experiments. *American Economic Journal: Macroeconomics*, 9(3):1–35.

Coibion, O., Gorodnichenko, Y., Kumar, S., and Pedemonte, M. (2020). Inflation Expectations as a policy tool? *Journal of International Economics*, 124:103297.

Das, A., Lahiri, K., and Zhao, Y. (2019). Inflation expectations in India: Learning from household tendency surveys. *International Journal of Forecasting*, 35(3):980–993.

Das, S., Kuhnen, C. M., and Nagel, S. (2020). Socioeconomic status and macroeconomic expectations. *The Review of Financial Studies*, 33(1):395–432.

De Bruin, W. B., Manski, C. F., Topa, G., and Van Der Klaauw, W. (2011). Measuring consumer uncertainty about future inflation. *Journal of Applied Econometrics*, 26(3):454–478.

de Bruin, W. B., Van der Klaauw, W., and Topa, G. (2011). Expectations of inflation: The biasing effect of thoughts about specific prices. *Journal of Economic Psychology*, 32(5):834–845.

De Bruin, W. B., Van der Klaauw, W., Topa, G., Downs, J. S., Fischhoff, B., and Armantier, O. (2012). The effect of question wording on consumers' reported inflation expectations. *Journal of Economic Psychology*, 33(4):749–757.

Dennis, R. (2009). Consumption habits in a new keynesian business cycle model. *Journal of Money, Credit and Banking*, 41(5):1015–1030.

Diamond, P. A. and Hausman, J. A. (1994). Contingent valuation: Is some number better than no number? *Journal of Economic Perspectives*, 8(4):45–64.

D'Acunto, F., Malmendier, U., Ospina, J., and Weber, M. (2021). Exposure to grocery prices and inflation expectations. *Journal of Political Economy*, 129(5):1615–1639.

Filippin, A. and Nunziata, L. (2019). Monetary effects of inequality: lessons from the euro experiment. *The Journal of Economic Inequality*, 17:99–124.

Ghate, C., Pandey, R., and Patnaik, I. (2013). Has India emerged? Business Cycle stylized facts from a transitioning economy. *Structural Change and Economic Dynamics*, 24:157–172.

Hausman, J. (2012). Contingent valuation: from dubious to hopeless. *Journal of Economic Perspectives*, 26(4):43–56.

Lewbel, A., Norris, S., Pendakur, K., and Qu, X. (2022). Consumption peer effects and utility needs in India. *Quantitative Economics*, 13(3):1257–1295.

Luttmer, E. F. (2005). Neighbors as negatives: Relative earnings and well-being. *The Quarterly Journal of Economics*, 120(3):963–1002.

Mankiw, N. G., Reis, R., and Wolfers, J. (2003). Disagreement about Inflation Expectations. *NBER Macroeconomics Annual*, 18:209–248.

Reserve Bank of India (2024). Consumer confidence survey: February 2024. Technical report, Reserve Bank of India.

Schoenle, R., Garcia-Lembergman, E., Hajdini, I., Leer, J., and Pedemonte, M. (2023). The expectations of others. Technical report, CEPR Discussion Papers.

Tsiaplias, S. (2021). Consumer Inflation Expectations, income changes and economic downturns. *Journal of Applied Econometrics*, 36(6):784–807.

A Appendix

A.1 Primary Survey: Questionnaire

There are two blocks in our questionnaire. The first block covers information on socio-demographic factors, while the second block covers information that the survey aims to collect, i.e., inflation expectations and relative position. The data collection process will be confidential, the anonymity of the respondents will be maintained, and the data will be used for academic purposes only. The identity of the respondents and their workplace can not be linked back in any way. households

Block 1: Socio-Demographic Details

1. S.No.
2. Location
3. Gender: *a) Male b) Female*
4. Age of the respondent:
5. Education of the Respondent: *a) Up to Primary b) Below Graduate c) Graduate and Above*
6. Number of Family Members:
7. Number of Earning Members:
8. Occupation of Respondent: *a) Employed/Regular Wages b) Daily Worker c) Homemaker d) Self-Employed/Business e) Others (Specify)*
9. Total Family/Household (all members included) Earnings (Upper limit included):
   a) Upto Rs 3 Lakh b) Rs. 3 Lakh -Rs 6 Lakh c) Rs. 6 Lakh -Rs 9 Lakh
   d) Rs. 9 Lakh -Rs 12 Lakh e) Rs. 12 Lakh -Rs 15 Lakh f) Above Rs. 15 Lakh

Block 2: Survey Questions

1. Over the next year, what do you think will happen to inflation? *a) Will Decrease b) Remain the same c) Will Increase d) Don't Know*

2. What do you expect the inflation level to be in the coming year? Can you provide a number for the same? (Say, over the past year, if the inflation level was at 6%, what do you think will be the inflation level at the end of 1 year.)

3. What has happened to your household income as compared to last year around the same time?
   a) Decreased b) Remained the same c) Increased

4. How do you rate your household as compared to your peers in terms of consumption level and standard of living? *a) Better Off b) Same c) Worse Off*

5. If the inflation level increases to 10%, on a scale of 1 to 10, where 1 is easy and 10 is difficult, how much difficulty will you face in maintaining the same standard of living compared to your peers?

6. If the inflation level increases to 15%, on a scale of 1 to 10, where 1 is easy and 10 is difficult, how much difficulty will you face in maintaining the same standard of living compared to your peers?

7. How would you tackle the increased cost of living?
   a) use my saving b) Borrowing c) Other Measures

8. Who do you think of when we ask about your peers? *a) Neighbours b) Relatives c) Friends*
   d) People in same income group e) Colleagues f) Others (Specify)

A.2 Details about the Questionnaire

The Reserve Bank of India (RBI) has conducted the Consumer Confidence Survey (CCS) bi-monthly since March 2015; previously, it was conducted quarterly from March 2012 to Decem-

ber 2014. The survey includes 19 Indian cities: Ahmedabad, Bengaluru, Bhopal, Bhubaneswar, Chandigarh, Chennai, Delhi, Guwahati, Hyderabad, Jaipur, Jammu, Kolkata, Lucknow, Mumbai, Nagpur, Patna, Raipur, Ranchi, and Thiruvananthapuram. It surveys approximately 5000 respondents each round, providing information on socio-demographic factors such as age, income level, gender, education level, occupation (job), household size, and number of earning members.

The survey asks respondents about their inflation expectations one year ahead, as well as their perceptions for the previous year. These questions range from the personal level, such as changes in income or consumption decisions, to macroeconomic conditions such as the overall economic situation, employment, inflation, and prices. Responses are recorded qualitatively rather than quantitatively. For example, when asked about inflation expectations, people can say they will decrease, stay the same, or increase. It does not provide a number indicating an individual's inflation expectation, such as 6% or 7%. For the respondents' income level, the questions until 2019 asked about monthly income, whereas the questions after 2019 asked about annual income. We grouped them into equivalent groups. For example, households earning up to Rs.10,000 per month can earn up to Rs. 1,50,000 per year.

A.3 Quantifying the Qualitative Responses of the Reference Group

The RBI using the CCS release the Consumer Confidence Index about the current situation and the future outlook of people about the economic condition of the country. They use the qualitative responses to quantify and construct an index. We follow the RBI approach (Reserve Bank of India (2024)). Consider a question about the state of the economy, to which an individual's response can be improved, remained the same, or worsened. We calculate the percentage of people who respond that the economic condition has improved (say, P1) and the percentage of people who respond that it has worsened (say, P2). The following step is to calculate the net positive response, which is the difference between the percentage of people who believe the economic situation has improved and the percentage of people who believe it has worsened (X1 = P1-P2). The economic condition index for any given time period is 100+X1.

If the index value exceeds 100, it indicates that more people have a positive outlook than those who have a negative outlook. And if it is less than 100, it indicates that more people have a negative outlook than a positive outlook. The index takes a value of 100 when the number of people having positive and negative outlook are the same, i.e. it acts like the baseline scenario that the economic condition would remain the same. This gives us both direction and magnitude of positive and negative sentiments in the economy. The index ranges from 0 to 200, where 0 means everybody has a negative outlook, and 200 means everybody has a positive outlook. In our case, instead of aggregating the index values at an aggregate level of each sample, we consider smaller subsets of the Reference Group. So, at a point in time while calculating the index value of an individual *i*'s reference group outlook towards income or consumption, we take all the individuals in the reference group and calculate the value of the index as specified above. If it is greater than 100, it indicates that the Reference group has a positive outlook, while a value less than 100 indicates that the Reference group has a negative outlook.