Factors Affecting Households' Inflation Expectations in Major Cities of Ethiopia

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Abstract

This study explores inflation expectations of consumers in major Ethiopian cities, focusing on Addis Ababa and Adama, where rising prices significantly affect consumers' purchasing power. Primary data were collected through a structured questionnaire from sample consumers within selected towns that were chosen based on population and cost of living. The study used simple random sampling to select respondents with access to marketplaces for Teff and onions, which are commonly, consumed food items. In the data analysis, the study employed econometric and descriptive statistics. The overall model was statistically significant, explaining 92.5% of the variability in the dependent variable. The linear regression model revealed that demographic and socioeconomic factors substantially affect consumers' inflation expectations, with sex and age showing no statistically significant effect on expectations. The model results show that households headed by secondary school graduates have a positive and significant effect on price rise expectations. Monthly incomes and home ownership of consumers have significant but negative effects on price rise expectations, while families with larger family sizes expect significant price rises. Participation in social capital mechanisms such as "Idir" significantly decreased expectations of price increments. To ensure stable household inflation expectations in Ethiopia, a comprehensive strategy addressing consumer awareness, income, and asset ownership is vital.

Keywords: Consumer purchasing power, Demographic factors, Ethiopia, Inflation expectation, Social capital

JEL Classification: E31, D84, O55

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1. Introduction

Ethiopia has recently experienced a significant surge in food inflation, which is confusing due to the nation's robust double-digit economic growth and delayed demand dynamics (Bane, 2018). Ethiopia's average annual inflation surged from 3.3% in 2000-2009 to 8.1% over the past decade, peaking at 55.3% in 2008. This consistent rise adversely impacted the economy, diminishing export competitiveness and purchasing power, and contributing to a decline in GDP growth from 11.4% in the 2000s to 8.4% in the 2010s. Factors like global price hikes, domestic drought, and expansionary policies fueled this inflation, underscoring the need to address this challenge and restore Ethiopia's high economic growth (Abebe, 2021;Tenaw and Demeke, 2020).

Inflation universally erodes consumer purchasing power. An overall rise in prices over time reduces what consumers can purchase with their money. Purchasing power refers to the quantity of goods or services that can be bought with one unit of currency. Generally, rising inflation means paying more money for identical goods and services. Inflation disproportionately impacts lower-income consumers who spend a larger share of their income on necessities than higher earners. An annual moderate inflation of 3-10% is considered walking inflation. Creeping inflation refers to a more modest rise in prices of less than 3% annually. A running inflation rate exceeding 10% implies successive price rises that could lead to hyperinflation (Kaplan *et* al., 2016).

Sub-Saharan Africa (SSA) is currently experiencing one of its most formidable economic challenges, marked by a surge in food and energy prices and a burdensome level of public debt. With food and energy comprising over half of household expenditures in sub-Saharan Africa, the cost of living has escalated substantially. Addressing the rampant inflation, which is severely harming incomes and food security, is a pressing concern. Since 2007, Ethiopia has consistently witnessed a relentless rise in prices, posing a critical dilemma for policymakers: stabilizing prices without adversely affecting living standards (Kizilirmak and Akkoc, 2021).

Short-term inflation in Ethiopia is driven by a rising money supply, shifts in the nominal exchange rate, and shocks to agricultural output. Recent inflation has been attributed to factors such as excess money, increasing exchange rates, global price hikes for food and non-food items, surges in energy prices, and disruptions in domestic agricultural supplies (Bane, 2018; Durevall et al., 2013). The relationship between household inflation expectations and consumer spending has significant

monetary policy implications (Burke and Ozdagli, 2021; Ranyard *et* al., 2008). To understand household economic decisions and how they are affected by monetary policy and inflation, it is a must to understand inflation dynamics at the household level (Kaplan *et* al., 2017).

Central banks worldwide are increasingly relying on indicators of public inflation expectations as a basis for shaping their monetary policies. When individuals respond to new information, they adjust their inflation expectations, and this sharing of information can lead to more informed and credible reporting of these expectations (Armantier *et* al., 2013).

In a country where most of the population spends their entire income on food and necessities, rising prices can lead to civil unrest and crime. For instance, when global food prices surged in 2008 due to a combination of rising fuel costs, climate shocks, and other factors, many Haitians could no longer afford staples like rice and beans. This led to widespread protests, riots, and civil unrest, which ultimately contributed to political instability. The situation highlighted how vulnerable populations, whose income is entirely allocated to essential goods, are severely impacted by inflation, potentially leading to increased crime and social unrest (Hendrix and Haggard, 2015).

In Ethiopia, goods prices regularly increase while incomes remain stagnant, and job creation lags behind the growing labor force. Ethiopia has experienced significant inflation in recent years, with consumer prices rising substantially. Additionally, job creation has lagged behind the expanding labor force. The number of unemployed people in Ethiopia increased from approximately 2.1 million in 2021 to nearly 2.23 million in 2022, indicating that employment opportunities are not keeping up with population growth. This combination of rising living costs, stagnant incomes, and insufficient job creation has strained the economic well-being of many Ethiopians, leading to massive social unrest (Haussmann *et al.,* 2023). This critical issue requires government intervention, as high inflation and unemployment could drive unemployed youth to join violent conflicts or turn to theft out of desperation. Addressing both inflation and unemployment is crucial to avoid further instability.

Most countries' monetary policies aim to control inflation rates by measuring them through an aggregate price index. However, aggregate price indices use an average consumption bundle and prices across goods and services. They do not necessarily match any individual household's consumption, prices paid, or inflation rate. To understand households' economic responses to monetary policy and inflation changes, we must examine inflation dynamics at the household level (Kaplan *et* al., 2017).

Furthermore, policymakers from various nations utilize household inflation expectations as a crucial reference point for determining inflation rates. In this context, inflation expectations play two pivotal roles in national banks. First, they provide a concise overview of where inflation is projected to trend, serving as essential inputs for the calibration of prices and wages. Second, they serve as a yardstick to assess the credibility of the inflation targets set by central banks. Despite several studies conducted in developed and developing countries, such as South Africa, there has been a noticeable gap in extensive research in this domain within sub-Saharan Africa (SSA), particularly in Ethiopia.

Teff is a staple grain in Ethiopia, particularly favored in urban areas and among middle-income households. Studies indicate that Teff consumption is more prevalent among urban households, with an average per capita consumption of about 62 kg per annum (Fikadu *et al*., 2019). Onions, on the other hand, are widely consumed across various income groups in Ethiopia. However, specific data linking onion consumption predominantly to middle-income households is limited. Generally, onions are a common ingredient in Ethiopian cuisine and are consumed by households across different income levels (Wondim and Geyo, 2024). In summary, Teff consumption is notably higher among urban and middle-income households, while onion consumption is widespread across all income groups in Ethiopia.

Consequently, this research endeavors to estimate the expected inflation rate among households for the upcoming year, drawing from primary data collected from consumers. With a specific focus on items that are presumed to be more frequently consumed in urban areas of Ethiopia, this study seeks to shed light on consumer inflation expectations. This study contributes to the existing body of knowledge by analyzing household inflation expectations. This research has the potential to offer valuable insights to policymakers in Ethiopia. To the best of my knowledge, this study is the first empirical analysis focusing on household inflation expectations in Ethiopia over the past three decades. The findings of this study are therefore incredibly valuable for informing economic policy and ensuring economic stability in Ethiopia.

The main objective of this study is to examine the factors that affect the inflation expectations of consumers in major cities of Ethiopia. Moreover, the study aims to identify potential drivers of inflation in Ethiopia based on the perceptions of consumers.

2. Review of the Literature

2.1. Theories of Inflation Expectation

Various theories contribute to the understanding of how household inflation expectations are formed, shedding light on the cognitive processes that influence these anticipations. Adaptive Expectations, developed in the early 20th century, particularly during the 1950s and 1960s, is a key concept in early macroeconomic models. It suggests that individuals form expectations about future events by relying on their past experiences, adjusting their views gradually as they observe changes in actual outcomes. This theory assumes that people do not have perfect foresight but instead base their expectations on historical trends and patterns (Marcet and Nicolini, 2003).

Rational Expectations, introduced by John Muth in 1961 and popularized by Robert Lucas in the 1970s, posits that individuals form expectations about the future by using all available information, rather than relying solely on past data. This theory suggests that people make predictions by considering the full spectrum of relevant information, including current and anticipated economic conditions, and adjust their expectations accordingly. It implies that individuals' forecasts are, on average, accurate and reflect all known factors (Mankiw and Reis, 2002).

Survey-Based Expectations became prominent in the late 20th century, especially during the 1980s and 1990s, as researchers began using surveys to directly capture the expectations of households, businesses, and financial markets. This approach allows for a more accurate reflection of how various economic agents anticipate future events based on their perceptions and experiences, rather than relying solely on theoretical models or historical data. Surveys became a valuable tool for understanding actual inflation and economic expectations (Carroll and Carroll, 2003).

Heterogeneous Expectations, fully developed in the 1990s and 2000s, recognize that different economic agents may form distinct expectations due to varying information sets or behavioral models. Unlike uniform expectations, this theory suggests that individuals or groups within an economy interpret information differently, leading to diverse predictions about future events. These variations in expectations reflect the complexities of real-world decision-making, where factors such as personal experiences, risk perceptions, and access to information influence how people anticipate future outcomes (Brock and Hommes, 1997).

Anchored Expectations, introduced in the 2000s, is a concept particularly relevant to central banking and inflation targeting. It refers to the idea that individuals' expectations of future inflation are "anchored" to a central bank's stated objectives, such as an inflation target. This means that people's inflation expectations remain stable and aligned with the central bank's goals, even in the face of short-term economic fluctuations, as long as they trust the bank's commitment to its objectives (Woodford, 2003).

The adaptive expectations theory proposes that households form inflation expectations based on past inflation trends, adjusting gradually as actual inflation changes. If inflation has been high recently, households will expect it to remain high in the future. This backward-looking approach means that expectations evolve slowly in response to differences between expected and actual inflation. Initially proposed by Milton Friedman and refined by Edmund Phelps in the 1960s, this theory implies that inflation expectations exhibit inertia and change slowly, allowing for short-term discrepancies between expected and actual inflation (Friedman, 1995; Phelps, 1967).

In developing economies, where formal economic education and detailed financial data are limited, households often rely on their personal experiences with inflation. They tend to adjust their expectations incrementally and see price fluctuations as temporary. This approach is particularly useful for empirical research and policy analysis, offering insights into household behavior in environments with constrained decision-making and limited information **(**Thomas, 1999; Nerlove, 1958). Therefore, the study is based on this theory.

2.2. Inflation Expectation

Inflation expectations refer to people's anticipations of future inflation. They play a crucial role in shaping human behavior (Armantier *et* al., 2013). According to Sims (2009) and, Gali (2008) inflation expectations play a key role in modern monetary policy implementation. Monetary authorities worldwide increasingly use public inflation expectation measures to design policy. Consumers often update their expectations based on new information, potentially improving the accuracy of their reported expectations. Since expectations drive behavior, they affect economic decisions such as saving, investing, and purchasing, which in turn affect actual inflation. Thus, monitoring inflation expectations is critical for central banks. Psychological theories suggest that consumers weigh price hikes more heavily than cuts, especially if they are large, frequent, and already of high concern (Armantier *et*

al., 2013). The connection between household inflation expectations and consumer expenditure has significant implications for monetary policy (Ranyard *et* al., 2008; Burke and Ozdagli, 2021). Furthermore, elevated inflation expectations stimulate current consumption or aggregate demand by diminishing consumers' motivation to save for the future (Vellekoop and Wiederholt, 2019; Duca et al., 2018).

2.3. Inflation at the Aggregate and Household Levels

Most monetary policies aim to control inflation by measuring it through an aggregate price index. However, these indices use average consumption bundles and prices across all goods and services. They do not reflect individual households' distinct consumption patterns, pricing, or inflation rates (Kaplan *et* al., 2017). To understand how inflation affects households' economic decisions, we must examine their personalized inflationary experiences.

Consumers' inflation outlooks derive from the price changes they regularly encounter rather than the aggregate rate. The frequency and magnitude of price hikes individuals face matter more than total expenditure shares for shaping expectations (Maniloff and Mastromonaco, 2017). Thus, models of inflation expectations should account for exposure to frequent, large price increases that individuals experience in daily life. However, central banks' inflation measures overlook this household-level pricing when designing inflation expectations (D'Acunto *et* al., 2019). Additionally, higher consumer inflation outlooks are associated with a greater probability of major purchases, as expectations influence spending plans (Duca *et* al., 2018).

Price flexibility plays a crucial role in shaping the impact of monetary policy, especially during the economic upheaval caused by the pandemic. The COVID-19 crisis has introduced substantial and sustained price fluctuations in the U.S. Since its onset in March 2021, approximately 24% of prices have been changing each month. The size of a company also influences its pricing behavior, with larger firms adjusting prices more frequently, approximately twice as often as smaller ones (Argente and Lee, 2021).

Inflation is a key determinant of well-being because it affects household purchasing power and the cost of living. However, households have diverse consumption patterns, leading to varying inflation rates. Using an average price index in official inflation calculations obscures these differences in purchasing power among households. To truly comprehend how monetary policy and inflation impact

household well-being, we must first grasp the divergence in inflation rates at the household level (Kizilirmak and Akkoc, 2021a).

Inflation does not affect everyone equally. On an aggregate level, the economy often behaves as described in standard monetary growth models with a representative agent. However, inflation has significant distributional consequences because it effectively acts as a regressive consumption tax. Consequently, overlooking these distributional effects can lead to misleading assessments of inflation's impact on any economy. Interestingly, much of the inflation literature has paid little attention to these distributional effects, despite evidence suggesting that inflation disproportionately burdens individuals with lower wealth and different transaction patterns compared to their wealthier counterparts (Erosa, 2000). Moreover, households with higher inflation expectations tend to save less (Vellekoop and Wiederholt, 2019).

Inflation expectations have a significant influence on economic decision-making. Investors rely on market inflation expectations to inform their investment choices, while businesses use these expectations to strategize capital investments, purchase decisions, pricing strategies, and determine borrowing needs for liquidity. When consumers anticipate rising inflation, they tend to purchase and stock up on goods now, expecting them to cost more in the future. This consumer behavior can, in turn, accelerate price increases (D'Acunto *et al.*, 2023).

2.3.1. Inflation expectation inequality and food price change

Inflation affects wealthy people differently than it affects less affluent people, potentially exacerbating income inequality. Various households react differently to price shifts and monetary policy instruments, influenced by their distinct characteristics and economic circumstances. Given its impact on household purchasing power and the cost of living, inflation serves as a critical indicator of well-being. Therefore, to grasp how monetary policy and inflation affect the well-being of households, we must delve into the variations in inflation rates across different households (Kizilirmak and Akkoc, 2021b).

Households have heterogeneous consumption baskets and experience varied price changes, resulting in personalized inflation rates that differ from the average. Aggregate inflation metrics ignore this cross-sectional distribution of inflation experiences. By only using overall average rates, analyses fail to capture the household-specific inflationary impacts that arise from diverse spending patterns and

exposure to particular price hikes. To accurately represent inflation dynamics, models must account for the dispersion of inflation rates across households rather than relying solely on aggregate measures. Capturing personalized inflation outlooks and impacts is crucial for policymaking and requires going beyond top-line inflation numbers (Kizilirmak and Akkoc, 2021b).

In Ethiopia, food prices climbed to unprecedented highs in July 2008, averaging 92% above prior levels, according to the Central Statistics Agency (2008, 2009). Prices then decreased, stabilizing at approximately 15% below the 2008 peak during the first half of 2009. When household inflation expectations rise, current spending increases faster than future consumption (Malmendier and Nagel, 2016). Some believe that short-run inflation outlooks particularly boost spending on nondurable goods such as food (Burke and Ozdagli, 2021).

Urban Ethiopian households allocate large shares of expenditures to food since they cannot produce their own food and lack rural self-sufficiency. With no formal insurance mechanisms, urban welfare is sensitive to food price shocks (Alem and Söderbom, 2010). Furthermore, food inflation imposes greater welfare costs on poorer versus richer households, and surveys show that inflation fears exceeded unemployment concerns, except during recessions (Berentsen *et* al., 2007). Generally, lower-income households face greater inflation than do higher-income households (Greg and Sam, 2017).

2.3.2. Determinants of inflation expectations on different groups

Inflation expectations exhibit significant disparities between genders, even among individuals sharing the same household. These variations could arise from traditional gender roles that subject women and men to distinct economic influences in their daily experiences, leading to systematic differences in their expectations. It is noteworthy that both men and women tend to have predictions for consumer inflation that are biased upward compared to actual outcomes, with women displaying a relatively larger upward bias (D'Acunto *et* al., 2019).

According to Mankiw and Reis (2002), households tend to update their expectations infrequently due to the perceived cost of acquiring information. Individuals with higher levels of education are more inclined to update their expectations more frequently, suggesting that they face lower costs when seeking information updates (D'Acunto *et* al., 2023; Coibion and Gorodnichenko, 2012). Additionally, inflation

tends to have a more significant impact on low-income households (Kaplan and Schulhofer, 2017).

Inflation expectations play a pivotal role in contemporary macroeconomics, and the transmission of new information often occurs gradually within society. Media reports serve as one avenue through which households gain information. Such media-driven information can directly influence households' inflation expectations by providing consumers with insights into the potential future trajectory of inflation (D'Acunto *et* al., 2023; Wang *et* al., 2020).

Inflation expectations diverge among households with varying demographic profiles. This discrepancy arises because households with different demographics often make distinct choices regarding their consumption patterns. Consequently, individuals who are younger, female, and possess higher levels of education tend to project higher inflation rates. Notably, it is a common belief that women, on average, anticipate greater inflation than men, possibly because they are often more responsible for grocery shopping and therefore are more frequently exposed to price fluctuations (Wang *et* al., 2020).

Furthermore, the level of education significantly influences inflation forecasts. It is posited that more highly educated households can better comprehend the potential consequences of various price shocks on inflation. Similarly, this principle extends to households with lower incomes under the assumption that these households are more likely to engage in financial markets and, as a result, possess greater awareness of inflation dynamics (Wang *et* al., 2020).

Inflation expectations often exhibit variations tied to socioeconomic and demographic factors within households, including age, income, and education. However, the exact reasons for these consistent disparities remain a subject of ongoing debate in the economic literature. International research has indicated that households with lower income and education levels, as well as women, unemployed individuals, and those at the younger and older ends of the age spectrum, tend to harbor higher inflation expectations and exhibit more forecast errors than other demographic groups. The causes behind these variations are still under discussion, but they have significant implications for policymaking in various ways (Poppitz, 2013). Additionally, gender differences in inflation predictions can be attributed to variations in everyday grocery shopping experiences (Malmendier and Nagel, 2016).

2.4. Measuring Inflation Expectation

Household surveys serve as invaluable repositories of socioeconomic data. These surveys often provide critical metrics that inform and oversee the implementation of development policies. In many developing countries, they have assumed a prominent role in data collection, sometimes supplementing or even supplanting other data-gathering initiatives and civil registration systems. Moreover, in developing and transitioning economies, household surveys are instrumental in researching small and medium-sized businesses, as well as small agricultural holdings (United Nations, 2005).

Central banks do not compute retail pricing indices, despite their relevance for monetary policy. In addition to current inflation metrics, central banks are also interested in households' inflation expectations across different time horizons and for various consumer goods categories. While not directly measuring personalized price changes, gathering data on households' future inflation outlooks provides insight into consumer perceptions shaping spending decisions. Capturing this forward-looking household perspective supplements current pricing indices with a key indicator of anticipated inflation (Wood and Bergh, 2002).

Various data sources are available for evaluating inflation expectations. One common approach involves employing a time series model that leverages historical inflation data to forecast future inflation. Another method is to utilize information from the term structure of interest rates to estimate forthcoming inflation expectations. Additionally, surveys that directly ask individuals about their personal inflation forecasts represent another prevalent and substantial source of data for gauging inflation expectations (D'Acunto *et* al., 2023).

Nardo (2003) noted that several surveys encompassing consumers have been conducted in European Union countries, Australia, and South Africa. Many of these surveys have focused primarily on collecting qualitative data, which involves respondents indicating whether they anticipate prices to rise, fall, or remain unchanged, rather than providing specific quantitative estimates of expected price changes. Typically, these qualitative responses need to be transformed into quantitative measures using various quantification methods (D'Acunto *et* al., 2023).

Households tend to remember prices they encounter regularly, which raises uncertainty when questioning their predictions about future price changes. It is unclear whether they are referring to the inflation reported in the media or the prices they observe in their daily lives. Moreover, when people express their expectations,

they may only recall the price changes that have significantly affected their specific products, not all items in their household basket (Poppitz, 2013).

The phrasing of questions in surveys about inflation expectations can lead to different interpretations. Therefore, it is advisable to use simpler language, such as inquiring about "prices in general," rather than specifying the "rate of inflation" (Armantier *et* al., 2015).

Ranyard *et al.* (2008), Jungermann *et al.* (2007), and Bates and Gabor (1986) have argued that when individuals are asked about prices in a general sense, they tend to consider specific price changes that have directly affected their personal lives rather than contemplating changes in the broader price level. Moreover, when respondents concentrate on price fluctuations linked to their unique experiences, they are more inclined to notice substantial increases, especially in products they frequently purchase, rather than smaller price changes or decreases (Armantier *et al.*, 2015). In line with these insights, the study aims to gather data on consumers' inflation expectations, with a specific focus on items that are commonly consumed in urban areas of Ethiopia, notably onion and Teff.

3. Methodology of the Study

3.1. Types and Sources of Data

In this research, primary data were collected from 396 individual consumers based on selected consumer goods believed to be commonly purchased among most urban dwellers in Ethiopia. A **cross-sectional survey** was used for the sample-based survey. As inflation expectations are a serious issue, direct face-to-face interviews were conducted with all sample units to obtain detailed information, explain any concept misunderstandings, and raise additional important questions as needed. Questionnaires allow for gathering data through structured dialogues, whether in person, by phone, or by mail (Wooldridge, 2010).

A non-probability sampling technique was employed to select sample towns. As Creswell and Creswell (2017) suggested, the size of the sample is often determined by the available budget for the study. Consequently, two towns were chosen as the sample for this research. The selection method used to pick these specific towns was purposive sampling, based on considerations of population size and cost of living, with household numbers being directly linked to the population size in Ethiopia.

According to the projection of the **Ethiopian Statistics Service** (ESS, 2022), the most highly populated towns in Ethiopia are Addis Ababa (3,860,000), Gonder (465,293), Mekele (457,917), and Adama (456,868). Furthermore, CSA data indicate that Addis Ababa, Hawassa, and Adama have relatively higher living costs. Since Adama has a larger population than Hawassa, it was selected for this particular research. Additionally, in line with Crewel's (2017) concept, the decision was made to gather data solely from Addis Ababa (with a population of 3,860,000) and Adama (with a population of 456,868).

To select sample households in the designated towns, a simple random sampling method was employed at the marketplace, specifically the sales locations for *Teff* and *Onion*. The interviews were conducted with individuals who were present to make purchases and who voluntarily agreed to participate in the interview. As indicated by Rafiq and Hailemariam (1986), the average family size in urban areas is 5.2. According to the 2019 Ethiopia Mini Demographic and Health Survey (EMDHS), the average household size in Ethiopia was 4.6 persons. In Addis Ababa, the average household size was reported as 4.9 persons in 2018. Specific data for Adama town is limited; however, a 2019 study on chronic undernutrition among children in Adama reported a mean family size of 4.5 persons. For comprehensive and up-to-date statistics, consulting the Central Statistical Agency (CSA) of Ethiopia's publications is recommended (Indicators, 2019).

Consequently, the number of households was calculated by dividing the total population by five, taking into account that, on average, one household typically includes five family members. The sample size represents the number of completed responses in the survey and serves as a representation of a small portion of the total population. For the calculation of sample sizes, a simplified formula from Yamane (1967) was employed, which can also be determined using the formula of Kothari (2004) (Creswell and Creswell, 2017).

$$n = \frac{z^2 \ .p.q.N}{e^2\,(N-1) + \ z^2.\ p.q}$$

where "**n"** is the sample size, **"N'** is the number of households, and **"e"** is the margin of error (precision level that expresses the level of confidence and equals 0.02).[4]

[4] The margin of error reflects the difference between actual and predicted outcomes in statistics. Larger margins can compromise reliability, while smaller ones indicate accuracy. In situations with unknown response numbers, estimating the margin is challenging. Hence, a moderate 2% margin is recommended for reliability (source: https://www.formpl.us/blog/margin-of-error).

"P" is the sample proportion that equals 0.02, **"q"** is (1-p= 1- 0.02 = 0.98), and "z" is the standard score obtained from the table and equals 1.96 for a confidence level of 95 %. Based on the above formula, the sample size for each city will be as follows:

Table 3: Population and household size of the sampled town

No	Name City (Town)	Population size (1)	Household (2)	Sample size (1/2)
1	Addis Ababa	3,860,000	772,000	188
2	Adama	456,868	91,374	187
	Total	4,316,868	863,374	375

Source: Own computation (based on the given data and formula)

Since the formula gives an equivalent number beyond a specific number of populations, we used the proportional value of the total sample for each place. Accordingly,

Equation 1: Sample size for Addis Ababa

$$\text{For Addis Ababa } = \frac{772{,}000 \; x \; 375}{863{,}374} = 335$$

$$\text{For Adama } = \frac{91{,}374 \; x \; 375}{863{,}374} = 40$$

Based on household numbers, a proportional sample size of 335 individuals was selected from Addis Ababa and 40 from Adama Town. However, benefiting from favorable conditions that facilitated the recruitment of more participants than initially planned, a larger sample size of 396 was employed instead of the originally calculated 375. This expanded sample size not only refines the precision of estimating population parameters but also tends to yield smaller confidence intervals, fostering more reliable estimates. Furthermore, the augmented sample size enhances the statistical power of the analysis, increasing the likelihood of detecting true effects or differences within the population. Additionally, a larger sample facilitates more robust analyses, offering more detailed and insightful findings. Its capacity to fortify results against sensitivity to outliers or unusual cases further underscores the decision to opt for a sample size of 396. In light of these considerations, a larger sample size is preferred (Leavy, 2022).

3.2. Model Specification

Linear regression provides a straightforward and interpretable way to model the relationship between a dependent variable and one or more independent variables. It can be used for predicting future values based on historical data, which is particularly valuable in economic analysis for forecasting trends, making economic projections, and informing decision-making (Gujarati and Porter, 2009; Wooldridge, 1996).

The combination of adaptive expectations theory and linear regression modeling offers a framework for comprehending how households develop inflation expectations and empirically examining these anticipations. Linear regression, known for its straightforward structure, enables the integration of adaptive expectations into empirical analysis. The relationship between inflation expectation theories and linear regression allows for the testing and validation of various expectation formation mechanisms, shedding light on the relative significance of each theory (Stanton, 2017). Notably, foundational insights into adaptive expectations and linear regression can be found in sources such as Cagan's work on hyperinflation dynamics (1956) and the econometrics textbook by Gujarati and Porter (2009), contributing to a comprehensive understanding of the subject matter within the context of economic modeling and policymaking.

To analyze micro-level inflation using the inflation expectations of households, a multiple regression model was used. In a multiple regression model, the study looks at the association between a particular dependent variable, **'Y,'** and a set of explanatory variables, X1, X2…, and Xk. Thus, the model is specified as follows:

Equation 3: Multiple regression model

$$\boldsymbol{avpoti} = B_0 + B_1\boldsymbol{Sex}_i + B_2\boldsymbol{logAge}_i + B_3\boldsymbol{Owh}_i + B_4\boldsymbol{logNmf}_i + B_5\boldsymbol{Edp}_i + B_6\boldsymbol{edus}_i + B_7\boldsymbol{edut}_i + B_8\boldsymbol{hhh}_i + B_9\boldsymbol{logMonin}_i + B_{10}\boldsymbol{idir}_i + B_{11}\boldsymbol{equb}_i + B_{12}\boldsymbol{baltina}_i + B_{13}\boldsymbol{mahiber}_i + \varepsilon_t$$

Where:

'avpot' represents the average inflation expectation of individuals for Onion and Teff in the upcoming year.

'Sex' denotes the gender of the respondent individuals,

'Age' indicates respondents' age,

'owh' signifies the ownership status of a house (1 for those who own a house, otherwise 0),

'Nmf' stands for the number of family members,

'edp' refers to individuals with a primary level of education,

'edus' represents individuals with a secondary level of education,

'edut' pertains to individuals with tertiary education (college and above),

'hhh' signifies whether the household is male or female-headed (1 for male-headed, otherwise 0),

'monin' denotes the level of average monthly income of individuals,

'equb' is a social capital indicator (1 for participation in *equb*, otherwise 0),

'idir' is a social capital indicator (1 for membership in *idir*, otherwise 0),

'baltina' is a social capital indicator (1 for participation in baltina, otherwise 0), 'mahiberi' represents social capital participation in mahiber (1 for participation, otherwise 0), and

'unemp' indicates employment status (1 for employed, otherwise 0)."

4. Results and Discussion

4.1. Demographic and Social Characteristics of Respondents

Table 2 below presents key demographic and social characteristics of the sampled respondents, wherein 52% are female, while the remaining 48% are male. In terms of housing ownership, 74% of respondents do not own a private house. Regarding educational background, 13% are primary graduates, 37% have attained secondary education, and the remaining 50% are tertiary education graduates. In line with this, 23% of the households are female-headed, while the majority are male-headed. In terms of social capital participation, 7% of the respondents are involved in *Idir*, 71% in *Equb*, 45% in *Baltina*, and 48% in *Mahiber*.

Table 4. Demographic and social characteristics of respondents

Respondents'	Number of respondents	Percentage respondents
Female	206	0.52
Male	190	0.48
House owners	104	0.26
None owners of house	292	0.74
Primary education	50	0.13
Secondary education	148	0.37
Tertiary education	198	0.50
Female-headed	93	0.23
Male-headed	303	0.77
Idir participants	27	0.07
Equb participants	280	0.71
Baltina participants	179	0.45
Mahiber participants	191	0.48

Source: Own computation

4.2. Linear Regression Result

The linear regression model conducted below in STATA provides valuable insights into the factors that influence individuals' inflation expectations for the average percentage increase in the price of Teff and Onion (avpoti). As shown in Table 3, the overall model is statistically significant $F(12, 383)= 395.36$, $p < 0.0000$), indicating that the independent variables have a significant relationship with the dependent variable. The model explains a substantial portion of the variability in the dependent variable, with an R-squared of 0.9230. This suggests that approximately 92.3% of the variation in the average expected price of Teff and Onion is accounted for by the included explanatory variables.

Table 5*:* Linear regression result

			Number of obs.	=	396	
			F(12, 383)	=	395.36	
			Prob > F	=	0.0000	
			R-squared	=	0.9253	
			Adj R-squared	=	0.9230	
			Root MSE	=	0.06943	
logavpoti	**Coefficient**	**Std. err**	**t**	**P>|t|**	-.0061063	.0271422
sexi	0.0105	0.0085	1.24	0.214	-.0489867	.0288181
logagei	-0.01008	0.0198	-0.51	0.611	-.0564028	-.0182811
ownhi	-0.0373	0.0097	-3.85	0.000	.0193525	.0550557
lognfmi	0.0372	0.0091	4.10	0.000	-.0149546	.0336856
edupi	0.0093655	0.0124	0.76	0.499	.0004924	.0319458
edusi	0.0162	0.0080	2.03	0.043	-.0138361	.0247236
hhhi	0.0054	0.0098	0.56	0.579	-.3604511	-.3278978
logmonini	-0.3442	0.0083	-41.58	0.000	-.0669696	-.0081178
idiri	-0.0375	0.0150	-2.51	0.013	-.0083266	.0251524
equbi	0.0084	0.0085	0.99	0.324	-.0316838	.0049046
baltina	-0.0134	0.0093	-1.44	0.151	-.0174562	.0231238
mahiberi	0.0028	0.0103	0.27	0.784	3.605172	3.935924
_cons	3.7706	0.0841	44.83	0.000		

Source: STATA result (2024)

4.3. Discussion

The coefficient of the variable "owning a house" is -0.037, with a p-value of < 0.000, suggesting that owning a house has a statistically significant negative impact on the expected average price of Teff and Onion. Those who own a house tend to have lower inflation expectations for Teff and Onion prices. This indicates that owning a house is associated with a 3.7% lower expected inflation on average, and homeowners may be less sensitive to fluctuations in the costs of Teff and Onion embedded in inflation measures.

The negative relationship between house ownership and inflation expectations may be due to the better wealth and assets of a household. Homeowners have invested in real estate, which serves as a form of wealth similar to having a higher income. Therefore, homeowners may have lower household inflation expectations.

The positive coefficient for the number of family members indicates a positive relationship between family size and the expected percentage increase in average

prices for Teff and onion in Ethiopia. The p-value, which is less than 0.05, provides strong evidence suggesting that an increase in family size is associated with statistically significant households' inflation expectations. Specifically, a 1% increase in family size leads to a 0.37% increase in the expectation of next year's average price for Teff and onion. However, this finding contradicts previous research by Kizilirmak and Akkoc (2021b) and Hayo and Neumeier (2018), who found that larger family sizes were associated with lower expectations for future inflation. A possible reason for this difference likely stems from contextual, methodological, and cultural factors. This study focuses on Ethiopia, a country with unique socio-economic and market dynamics, where larger family sizes might increase demand for staple goods like Teff and onion, driving higher price expectations. In contrast, the other studies may reflect economies where larger families benefit from economies of scale, reducing perceived financial strain and inflation expectations. Variations in datasets, econometric models, cultural norms, and economic environments further contribute to the difference. In summary, the results suggest a robust statistical association between family size and expected price increases for Teff and onion in Ethiopia.

In this result, education is not significant. The findings of this research are somewhat similar to those of Alem and Söderbom (2010), who reported that education has little effect on inflation expectations. More specifically, the results obtained here align with those of Coibion and Gorodnichenko (2012), who found the same relationship between education and inflation expectations.

The variable monthly income has a coefficient of -0.3442 with a p-value < 0.000, suggesting that a higher income level is associated with lower inflation expectations. As monthly income increases, households' inflation expectations tend to decrease. Individuals with higher monthly income levels may perceive themselves as having greater financial stability. This could lead to lower concerns about the impact of rising prices and inflation on overall financial well-being. As a result, they may have lower inflation expectations. In addition, economic theory suggests that as an individual's income increases, the marginal utility derived from each additional unit of income decreases. In simpler terms, individuals with higher incomes may prioritize saving and investing more than immediate consumption. This behavior can result in lower current consumption, which can be associated with lower inflation expectations.

This study revealed a strong and statistically significant relationship between income and inflation expectations, which is consistent with Kizilirmak and Akkoc (2021b).

Their research showed that inflation expectations differ across income groups, with the specific patterns contingent on the country being studied.

The coefficient for "Idir" is -0.038, which is highly significant (p-value < 0.013), indicating a strong negative correlation with expected percentage increases in prices. Participation in Idir suggests a more optimistic outlook on future price increases. This may be attributed to the social and financial support provided by Idir, fostering stability and security. Community members with a robust support system are less vulnerable to economic uncertainties, leading to lower expectations of price increases. The communal nature of Idir encourages information-sharing and collective strategies, influencing perceptions of inflation. These findings highlight the impact of social capital, as demonstrated by Idir, on economic expectations and community resilience.

According to WFP (2021), food inflation in Ethiopia accounted for 54% of inflationary pressures, with rates declining slightly from 42% in September to 40.7% in October 2021. However, this research showed that households' expected inflation for the average price of Teff and Onion in the next year, 2023/24, is much greater than that in the WFP 2021 report, reaching almost 73% in Ethiopia. This requires greater attention from all local and federal government bodies.

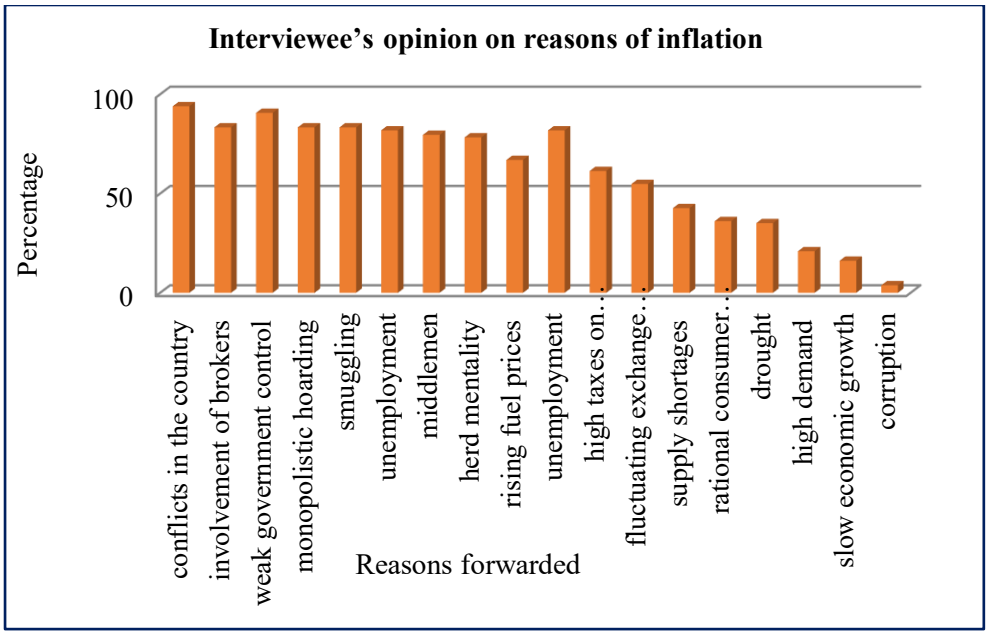
4.4. Respondents' Opinion on the Causes and Remedies of Inflation

A survey of 396 Ethiopian consumers was conducted to identify the key factors driving inflation in the country and to gather recommendations based on their experiences. The results indicate that inflation is influenced by a combination of economic, policy-related, and structural challenges. The most frequently cited factor, as indicated below in Figure 1, was internal conflicts, reported by 93.94% of respondents, followed closely by broker involvement (92.68%) and weak government control systems (90.66%). Other significant contributors included monopolistic hoarding and smuggling (83.33% each), unemployment (81.82%), middlemen activities (79.55%), and herd mentality in pricing (78.28%).

Additional factors identified were rising fuel prices (66.92%), high taxes on consumption goods (61.36%), and fluctuating exchange rates (54.8%), all of which contribute to price instability. Respondents also pointed to supply shortages (42.68%), irrational consumer behavior (36.11%), drought (35.1%), high demand pressures (20.96%), slow economic growth (16.16%), and corruption (3.79%) as factors exacerbating inflation. These findings highlight the multifaceted nature of

Ethiopia's inflationary pressures, which stem from both domestic and external economic conditions, as well as structural inefficiencies in market regulation and supply chain management.

Figure 1. Reasons of Inflation (Source: From Interviewees**)**

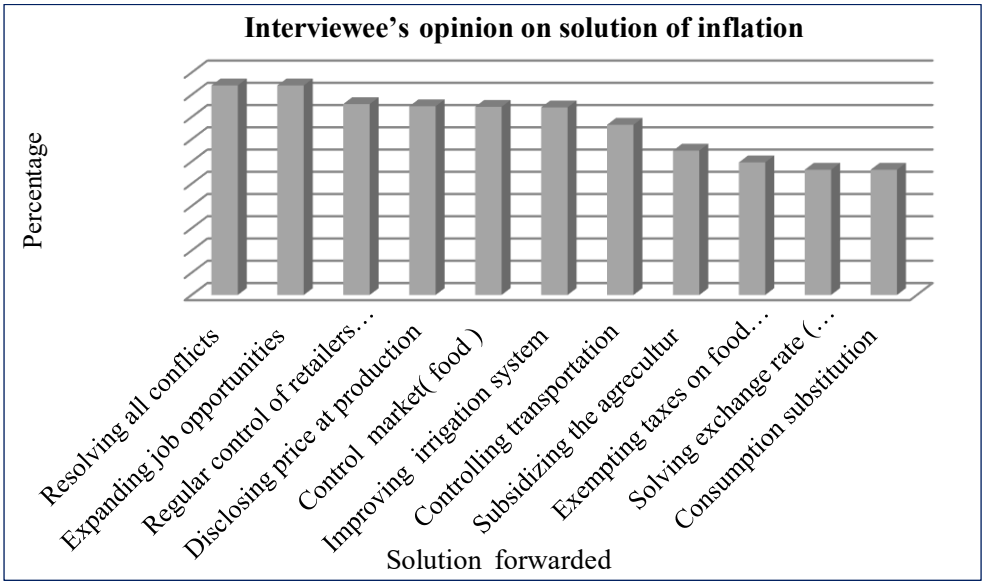


To address the challenges of inflation, the surveyed consumers proposed various solutions aimed at stabilizing prices and improving economic conditions, as shown in Figure 2 below. The most frequently suggested measure was resolving internal conflicts, cited by 94.19% of respondents, along with expanding job opportunities for the youth (94.19%) to reduce unemployment-driven inflation. Additionally, 85.86% of participants emphasized the need for regular monitoring of distributors' and retailers' inventories, ensuring necessary interventions when needed. Raising awareness about price fluctuations at production and sales locations across all regions (84.85%), enhancing market control over food and consumption goods (84.6%), and improving the national irrigation system (84.34%) were also among the key recommendations.

Other suggested measures included supervising the transportation system through fuel subsidies (76.52%), increasing support for farmers, and promoting urban agriculture to strengthen supply (64.9%), and reducing or exempting taxes on food and essential goods (59.6%). Furthermore, 56.31% of respondents stressed the

importance of regulating the black market exchange rate and promoting awareness of consumption substitution to encourage more sustainable spending habits. These recommendations highlight the need for a combination of economic, regulatory, and structural reforms to effectively combat inflation and stabilize the Ethiopian market.

Figure 2: Solution of inflation



Source: from Interviewees

5. Conclusions and Recommendations

5.1. Conclusions

This study provides valuable insights into the determinants of inflation expectations among urban Ethiopian households. The results reveal that demographic and socioeconomic factors, as well as households' income, significantly influence individuals' outlook on future food price changes. Housing ownership has been associated with lower inflation expectations, potentially because owning a house implies better wealth and financial stability, akin to having a higher income. Higher income levels are associated with lower inflation expectations, reflecting greater financial stability, which results in a secured livelihood due to the capacity for saving rather than investing in immediate consumption. The study found a positive relationship between family size and the expected percentage increase in prices, which implies that households with larger consumption spending may fear the future.

Social capital mechanisms, like *Idir*, have a significant but negative effect on consumers' inflation expectations.

In conclusion, the survey reveals key perspectives of Ethiopian consumers regarding inflation challenges. Respondents highlighted several areas of focus, including resolving internal conflicts, expanding youth job opportunities, and regularly supervising distributor and retailer inventories. Additionally, creating awareness about price fluctuations, improving control over food and consumption markets, and enhancing the national irrigation system were seen as critical solutions. These findings underscore the importance of addressing these issues to effectively tackle inflation in Ethiopia.

5.2. Recommendations

To enhance inflation expectations of consumers effectively, policymakers and stakeholders should work on improving awareness among consumers in urban areas. Moreover, government officials concerned with managing inflation and related macroeconomic problems should improve financial security, asset creation, and promote homeownership for urban households to enhance consumers' awareness of expected price rises in consumable items. Expanding social protection programs and leveraging community-based support systems like ***Idir*** can help consumers bridge perception gaps. Additionally, investments in agricultural productivity, irrigation systems, and resolving conflicts in different areas of the country are crucial for stabilizing food prices. Addressing these areas holistically will contribute to improving households' inflation expectations and enhancing household economic resilience in Ethiopia.

Limitations of the study

The research did not include samples from rural areas but purely focused on urban populations of Ethiopia, since the crops considered in the analysis are a main source of spending for urban people, but not for the rural. The scope is constrained to inflation expectations among urban households, omitting rural viewpoints, which may be considered a limitation for achieving a national-level generalization. Despite limitations in geographic scope, this study aims to provide a meaningful initial analysis of inflation expectations that are grounded in urban consumer perspectives in Ethiopia.

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