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Research Article

Interacting Expectations: A Study of Short-Term and Long-Term Inflation Forecasting in India

Dr. Trisha Jolly[1*], Dr. Kavita Indapurkar[2]

[1*]Assistant Professor, Department of Economics, Janki Devi Memorial College, University of Delhi
[2]Jt. Director and Dean, Amity School of Economics, Amity University, Noida

***Corresponding Author:** Dr. Trisha Jolly
*Assistant Professor, Department of Economics, Janki Devi Memorial College, University of Delhi

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ABSTRACT

Inflation is a psychological phenomenon that affects people's purchasing decisions, with the US economy experiencing an 8.5% inflation rate in 2022. People's beliefs about inflation are based on emotions rather than facts, making them illogical. People may change their behavior in response to inflation by looking for sales, trading down, putting off purchases, buying in smaller amounts, or buying in larger amounts due to bulk purchases. Discount stores like Costco or Walmart are often used to attract customers who are hesitant to pay more for their goods.

Businesses react to inflation differently based on their classification, with lower-tier or value brands replacing premium brands. Store brands like CVS and Target often see sales rise during inflation periods. For example, Costco offers petrol discounts to attract customers who are hesitant to pay more.

Inflationary expectations play a significant role in determining actual inflation outcomes in different economies. Milton Friedman's work in the 1960s laid the groundwork for incorporating individual expectations into macroeconomic models, guiding future research. His ideas inspired a generation of economists to examine how expectations affect macroeconomic models, asset prices, and money movement in the economy.

Inflation expectations are crucial for maintaining economic stability, and their formation and holding in place vary depending on the economic theory and real-world situation. The rational expectations hypothesis, proposed by John Muth in 1961, suggests that people make expectations based on all available information. Behavioral models and surveys are used to guess inflation based on perceived prices. Central banks worldwide recognize the importance of expectations in maintaining economic stability.

Emerging market economies, such as India, face challenges such as inequality, structural unemployment, and weak institutions. Globalization has also exacerbated inequality and inflation. Inflation is both a sign of and a cause of larger changes in the economy, and maintaining stable prices is essential for building investor trust and encouraging long-term growth.

Policymakers can better manage inflation and predict how people will act by understanding how agents like consumers, producers, employers, and employees form expectations. The Phillips Curve, the Phillips Curve-augmented form, the New Keynesian Curve, and the Hybrid New Keynesian Curve all use inflation expectations as a key factor in price behavior.

As the world's economies become more connected, policymakers must understand and manage expectations to ensure long-term economic stability. In conclusion, including inflationary expectations in the study of inflation changes over time is essential for understanding and managing inflation.

This study examines how inflation expectations explain actual inflation trends in India. Three groups of hypotheses are tested: the link between actual inflation and expectations for three months from now, the link between actual inflation and expectations for the next year, and how expectations change over time. The

Reserve Bank of India collected time-series data on household inflation expectations to determine if they are adaptive. The data was tested for stationarity and a unit root to ensure accurate regression or trend analysis.

Inflation expectations are active forces that influence economic behavior and policy responses, rather than being passive reflections of expected price movements. They are crucial in the theoretical framework established by Kydland and Prescott (1977) and Barro and Gordon (1983), especially in emerging market economies. Central banks in these economies aim to maintain a stable rate of inflation and lessen price volatility, which cannot be achieved without taking economic agents' expectations into account.

Economic theory has long recognized the critical role expectations play in inflation dynamics, with Milton Friedman's adaptive expectations hypothesis signaling a paradigm shift. Bernanke and Mishkin (1997) emphasize the importance of inflation expectations in determining the efficacy and legitimacy of monetary policy, particularly in emerging market economies where structural vulnerabilities make anchoring expectations more difficult.

Inflation expectations have been measured across various economies using various methods, including the rational expectations hypothesis, behavioral models, survey-based approaches, and indicator-based approaches. Central banks have made efforts to understand the pivotal role expectations play in determining macroeconomic outcomes. Jan Marc Berk's research in the Netherlands used consumer surveys to measure inflation expectations using the Carlson-Parkin probability approach. The study aims to examine the impact of inflation expectations on actual inflation in the Indian economy using the Reserve Bank of India's quarterly Inflation Expectations Survey of Households (IESH). The survey collects data every three months from 12 cities, including the four biggest cities, and asks about 4,000 households' expectations for price changes over the next three months and one year. The survey collects both qualitative and quantitative data, focusing on how respondents see general and specific price trends over the short and medium term. The study found that Indian households do not all consume the same way, due to differences in culture, religion, education, lifestyle, and local economic conditions. This makes a one-size-fits-all monetary policy approach useless in a country as diverse as India.

The Reserve Bank of India (RBI) has consistently improved the household inflation expectation survey to make it more accurate and useful. Changes to the sample size, sampling framework, and forecast horizon are part of these changes, aiming to make estimates more detailed and specific. The 2009 RBI Internal Group Report praised the success of the survey project and suggested making the data public on the RBI's official website to encourage openness, raise public awareness, and build trust in the monetary policy framework. Adding inflation expectations to macroeconomic analysis has been helpful in understanding how people's perceptions affect their economic behavior. The RBI's household survey provides timely and useful information, allowing policymakers to better understand how people form inflation expectations and how to change them. By focusing on factors that cause expectations, such as recent price trends, news stories, and local consumption patterns, policymakers can create measures that better anchor expectations and help keep actual inflation from going up too much. Aligning policy changes with the main factors that affect household expectations can help close the gap between what people expect and what actually happens with inflation, making monetary policy more credible and strengthening its spread.

The Reserve Bank of India (RBI) conducted a quarterly Inflation Expectations Survey of Households from March 2009 to December 2019. The data points from the survey show that inflation expectations closely follow actual inflation trends, providing a strong basis for understanding and predicting price levels in the Indian economy. However, there is still a consistent gap between actual inflation and expected inflation, with expectations generally being higher. This difference highlights the importance of studying the factors that affect how households expect inflation to change. Targeted policy changes that fill in these gaps can make inflation predictions more accurate and improve monetary policy. The graph shows that the three variables move together strongly, providing a strong basis for understanding and predicting price levels in the Indian economy.

A study examining the impact of inflation expectations on actual inflation in India found that both variables, expectations three months ahead and expectations one

year ahead, explained a significant part of the change in actual inflation. The regression analysis showed that people base their decisions about current and future prices on their expectations, both those they have recently and those they have in the future. The results support the theoretical literature that inflation expectations play a big role in determining actual inflation outcomes.
The correlation matrix for the three variables showed a strong linear relationship between actual inflation and expectations. The correlation coefficient between inflation that has already happened and expectations three months ahead is 0.984, and there is a 0.960 correlation between actual inflation and expectations for one year from now. This behavior gives policymakers important information about how inflation works and how monetary policy spreads.
In conclusion, the results show that inflation expectations have a real effect on inflation, making it even more important to include expectation management as a key part of India's inflation-targeting strategies. The regression model can be considered statistically sound and a good way to look at the link between inflation expectations and actual inflation in India.
The regression model reveals that inflation expectations three months ahead and one year ahead can explain the actual inflation rate reported by survey respondents. The model accounts for a large part of the total sum of squares, with a low residual sum of squares. The F-statistic's significance value is 0.000, indicating that the two expectation variables can be trusted to predict the actual inflation rate. However, more research is needed to determine the importance and strength of each predictor on its own.
The correlation matrix between actual inflation and expectations for the next three months shows a strong positive linear relationship, with a correlation coefficient of 0.984. This results support the behavioral idea that people base their expectations on short-term price trends, which then affects how they think about current inflation.
The regression results are statistically strong and reliable for the sample, showing that about 96.9% of the total change in actual inflation can be explained by what people thought prices would be three months from now. The adjusted R-squared stays high at 96.8%, and the mean square residual (MSR) is low at 0.327, indicating a small unexplained variance.
In conclusion, the regression model is a strong and reliable way to understand how short-term inflation expectations and actual inflation are related. The regression model explains the actual inflation rate based on survey respondents' predictions of inflation over the next three months. The model is statistically significant at the 5% level, indicating that short-term inflation expectations can predict the actual inflation rate. The results show that for every 1-unit rise in short-term inflation expectations, the actual inflation rate rises by about 0.984 units, demonstrating the strong relationship between short-term expectations and actual inflation outcomes. These results support the idea that short-term expectations are reliable inputs for predicting inflation outcomes.

Keywords: Inflation, Inflationary Expectations, Consumer Behavior, Consumption Behavior, Advanced Macroeconomics

Introduction

People's beliefs about inflation are more psychological than logical, so they can be very different. US economy recorded inflation about 8.5% in the year 2022, but it changes depending on the category. Economists look at a group of goods and their past prices. People often use subjective judgement, especially when buying petrol and groceries.

People change their behaviour in response to inflation by looking for sales, trading down, putting off purchases, buying in smaller amounts, or buying in larger amounts because they are buying in bulk. People tend to shop at discount stores like Costco or Walmart when prices go up, which can lead to more purchases in the short term. But you can't say that everyone buys less or trades down, because it depends on the situation of each person. For instance, people might spend more on food they will eat at home if they go out to eat less.

In a nutshell, how people see inflation affects how they shop, and this can be different for different types of goods. People's beliefs aren't based on logic; they're based on psychology. The news articles and the prices of the things they buy often affect how they shop.

Because they base their assessment of uncertainty on emotions rather than facts, people's beliefs are illogical. For example, people may think that flying is riskier than driving after an air crash, but this isn't always the case. People who are struggling with the cost of living may be adversely affected by social media feeds about price

increases. Democratic leaders may wish to draw attention to the unemployment rate, but facts alone won't make people feel any differently. Political leaders find it frustrating to realise that people's emotions are more important than facts, but this realisation has significant ramifications for their communication style. It's important to identify and convey information that appeals to the intuitive feelings of certain politicians, such as Bill Clinton.

Having understood the relevance of the way how consumers' buying behaviour changes in response to the prince change, it provides a rationale for the sellers to assess their selling patterns and mechanisms. Depending on their particular classification, businesses react to inflation in different ways. Usually, lower tier or value brands take the place of premium brands owned by companies like Procter & Gamble and Unilever. Store brands like CVS and Target are frequently emphasised, and their sales typically rise during periods of inflation. For instance, Costco draws customers who don't like to pay for petrol by offering a few cents off. Additionally, businesses make minor adjustments to price and quantity, like increasing the quantity of potato chips or decreasing the number of rolls in toilet paper packages. Customers will be less aware of price increases of 16% as a result. Offering a petrol discount is a smart tactic used by Costco to draw in customers who are hesitant to pay more for their goods.

Data and Research Methodology

A lot of research in the current economic literature has shown how much inflationary expectations affect actual inflation outcomes in different economies. The current study go into great detail about this topic, with input from important scholars. This part goes over some important works again to strengthen the theoretical and empirical bases for understanding how expectations affect price changes.

Englander and Stone (1989) stressed that inflationary expectations are a key factor in determining actual inflation. Their research showed how expectations affect household choices in many areas, such as spending, investing, negotiating wages, finding a job, and how the financial markets behave. In the same way, Kydland and Prescott's (1977) and Barro and Gordon's (1983) foundational studies showed how important inflationary expectations are, especially for central banks in emerging market economies, where the main goals of monetary policy are to stabilise inflation and lower price volatility.

It is not a new idea that expectations play a big role in how the economy works. Milton Friedman's work in the 1960s laid the groundwork for incorporating individual expectations into macroeconomic models. Friedman introduced the idea of inflationary expectations as a key part of understanding how the economy works in his famous speech to the American Economic Association in 1967. He asked three important questions that still guide macroeconomic research today:

- How can we find out what people think about inflation?
- How do people's expectations affect real inflation?
- What makes people think about inflation, and how strong are those thoughts?

Friedman's ideas inspired a whole generation of economists to look into how expectations affect macroeconomic models, such as how they affect asset prices and how money moves through the economy. Ben Bernanke and Frederic Mishkin (1997) built on this line of research by stressing how important expectations are for the success of monetary policy, especially in developing countries.

There are different ways to measure inflation expectations, depending on the economic theory and the real-world situation of the economy in question. The rational expectations hypothesis was first proposed by John Muth in 1961. It says that people make expectations based on all the information they have. Krusell and Spolander (1994), on the other hand, used behavioural models to guess inflation based on what they thought prices would be. These indirect methods are used along with more direct ones, like surveys or indicators, which use observable macroeconomic variables that are part of theoretical frameworks.

Central banks all over the world know how important expectations are for keeping the economy stable. A lot of people have done real-world research to learn more about how expectations are formed and held in place. For example, Jan Marc Berk (1999) used the Carlson-Parkin probability method to look at price changes and inflation expectations based on consumer surveys in the Netherlands. He looked at the qualitative parts of measuring expectations by putting people into groups and looking at their biases. One important finding was that past trends in inflation have a big effect on what people expect in the future. Another important finding was that inflation expectations and central banks' use of inflation-targeting regimes are linked in both directions.

When it comes to emerging market economies, inflation expectations become even more important. These economies often have to deal with a number of problems within their own borders, like inequality, structural unemployment, and weak institutions. At the same time, they have to deal with problems that come from being part of the global economy. India has changed a lot since it opened its markets to foreign competition after liberalisation. Globalisation has created chances for growth, but it has also made inequality and inflation worse. So, inflation is both a sign of and a cause of bigger changes in the economy as a whole. As financial markets become more important in closing the gap between saving and investing, keeping prices stable becomes even more important for building investor trust and encouraging long-term growth. In a global economy that is so

connected, inflation shocks in one part of the world can quickly spread to other parts of the world. This makes it even more important to manage inflationary expectations through good policy.
Even though the specific causes of inflation vary from country to country, inflation expectations are still a key factor everywhere. Policymakers can better manage inflation and predict how people will act if they know how agents, like consumers, producers, employers, and employees, form expectations.
John F. Muth (1961) laid the theoretical groundwork for modelling inflation expectations in macroeconomic analysis. Robert Lucas and others in the rational expectations school built on Muth's ideas. They said that macroeconomic models should include behaviour that looks ahead, which would make them more accurate representations of how the economy really works. This way of thinking also had an effect on the development of the Phillips Curve, especially in its expectations-augmented form (Friedman, 1968; Phelps, 1967), the New Keynesian Phillips Curve (Goodfriend & King, 1997), and the Hybrid New Keynesian Phillips Curve (Fuhrer & Moore, 1995; Gali & Gertler, 1999; Roberts, 1997). All of these models use inflation expectations as a key factor in how prices behave.
More and more people are realising how important inflation expectations are in real life, which has led to a lot of policy adoption. Lewis Johnson (1976), using Mundellian arguments, stressed how expectations affect macroeconomic variables. By the 1980s, about 25 developed economies had officially added inflation expectations to their monetary policy frameworks. By the end of the 20th century, this number had grown to 45 (Figlewski & Watchel, 1981), showing that the expectations channel was widely accepted in macroeconomic management.
This change around the world also made researchers want to look into how expectations are formed in different social, economic, and institutional settings. Econometricians and policy researchers both knew that inflation expectations are affected by many country-specific factors, such as past inflation trends, how much people trust central banks, how easy it is to get information, and cultural and economic norms. To make good and specific monetary policies, you need to know these small differences.
In short, the literature makes a strong case for including inflationary expectations in the study of how inflation changes over time. It shows how they affect not only actual inflation but also bigger macroeconomic outcomes, especially in developing countries like India. As the world's economies become more linked, policymakers' ability to understand and manage expectations will be a key factor in making sure the economy stays stable in the long run.
The main goal of this study is to look at how inflation expectations help explain the actual inflation trends in the country. Three groups of hypotheses have been made to help reach this goal.

Set 1: The link between actual inflation and expectations for three months from now

Since people's short-term expectations may affect or reflect actual inflation trends, the first hypothesis tests whether actual inflation moves in line with expectations for the next three months:
• H_0: Actual inflation moves in the same direction as people's expectations for inflation three months from now.
• H_1: Actual inflation does not move in sync with what people think inflation will be like three months from now.

Set 2: The link between actual inflation and expectations for the next year

The Reserve Bank of India asks people about their expectations for the next twelve months as well as the short term. So, the second set of hypotheses tests how well long-term expectations match up with actual inflation:
• H_0: Actual inflation moves in the same way as people's expectations of inflation one year in the future.
• H_1: Actual inflation does not move in sync with people's expectations of inflation one year ahead.

Set 3: How expectations change over time

This could mean that people change the way they think about inflation if their expectations for three months from now affect their expectations for one year from now. To look into this, the third set of hypotheses is set up like this:
• H_0: People's expectations for inflation three months from now explain their expectations for inflation one year from now.
• H_1: The expectations of people one year ahead are not based on their expectations of inflation three months ahead.

The Reserve Bank of India collected time-series data on household inflation expectations to see if the expectations people have are adaptive. Because the dataset changes over time, it's important to check for stationarity and a unit root to make sure that any regression or trend analysis is accurate.
So, both series—expectations for three months and one year ahead—have been put through unit root tests. First, they looked for drift, and then they looked at both drift and trend. After that, the Dickey-Fuller test (with a one-period lag) and the Augmented Dickey-Fuller (ADF) test (with two lags) were used.
There was a common hypothesis framework for all of these tests:
• H_0 : There is a unit root, which means the series is not stationary.
• H_1: says that there is no unit root, which means that the series is stationary.

These statistical tests lay the groundwork for figuring out how reliable the data is and how inflation expectations and actual inflation relate to each other over different time periods.

Discussion

The significant impact that inflation expectations have on the actual inflation outcomes in an economy has been extensively studied in the field of macroeconomics. This literature highlights that inflation expectations are active forces that influence economic behaviour and policy responses rather than being passive reflections of expected price movements.

Inflationary expectations are emphasised by Englander and Stone (1989) as a crucial factor in determining actual inflation, among other noteworthy contributions. Their research goes further to show how expectations affect a variety of household decisions, such as investment, wage negotiations, employment decisions, consumption, and even financial market speculation. Inflation expectations are given a lot of weight in the theoretical framework established by Kydland and Prescott (1977) and Barro and Gordon (1983), especially when it comes to central banks in emerging market economies. According to their research, one of the main goals of monetary policy in these kinds of economies is to maintain a stable rate of inflation and lessen price volatility, which cannot be accomplished without taking economic agents' expectations into account.

Economic theory has long recognised the critical role expectations play in inflation dynamics. Incorporating inflation expectations and forward-looking behaviour into macroeconomic policy frameworks was made possible in large part by Milton Friedman's seminal work in the 1960s. By acknowledging that people create expectations based on prior experiences, which in turn affect present economic outcomes, Friedman's adaptive expectations hypothesis signalled a paradigm shift. Building on this, Bernanke and Mishkin (1997) emphasised how crucial inflation expectations are in determining the efficacy and legitimacy of monetary policy, particularly in emerging market economies where structural vulnerabilities make anchoring expectations more difficult.

As a reflection of the diversity in economic theory, several methods have been developed to measure inflation expectations across various economies. The rational expectations hypothesis, put forth by John Muth in 1961, provided a formal mechanism through which agents effectively forecast future prices using all available information, bringing expectations into close alignment with economic fundamentals. On the other hand, models such as those put forth by Kruismanen and Spolander (1994) take a behavioural approach, estimating actual inflation from expectations while accounting for cognitive and psychological biases. By relating expected price changes to observable real variables, these models frequently function as indirect instruments for measuring inflationary sentiment.

To measure inflation expectations, more direct techniques have been developed in addition to these indirect ones. These consist of survey-based approaches, which gather information straight from businesses or consumers, and indicator-based approaches, which deduce expectations from macroeconomic or market data. Globally, central banks have made significant efforts to pinpoint the critical elements that underpin public expectations as they have come to understand the pivotal role expectations play in determining macroeconomic outcomes.

For example, Jan Marc Berk (1999) used consumer surveys to measure inflation expectations in the Netherlands using the Carlson-Parkin probability approach. His research, which divided participants into six groups according to the type and bias of their answers, illuminates the qualitative difficulties of measuring expectations. The results show that the historical performance of inflation in an individual's economy has a significant impact on their forecasts. The reciprocal relationship between inflation expectations and the application of inflation-targeting monetary policy is one of the most important findings from Berk's research. His research offers a methodological framework for comprehending how Dutch households develop inflation expectations over a twelve-month period, with important ramifications for monetary policy design and communication.

When considered collectively, this extensive literature confirms that a fundamental component of contemporary macroeconomic analysis is inflation expectations. They act as a vital conduit between monetary policy and actual economic results in addition to influencing institutional and individual decision-making. The complexity and significance of this topic in theoretical and policy-oriented economic research are reflected in the changing approaches to measuring and managing expectations.

The main goal of this paper is to look at and see if inflation expectations have a big effect on actual inflation in the Indian economy. The study uses the Reserve Bank of India's (RBI) quarterly Inflation Expectations Survey of Households (IESH) to look into this. The RBI started this survey in September 2005 to systematically gather information about how people feel about price changes because they know that inflation expectations are a big part of how actual inflation works.

The survey uses a structured method that includes collecting data every three months from 12 cities, including the four biggest cities. At first, about 4,000 households were asked about their expectations for price changes over the next three months and one year. They were asked if prices for a certain group of goods would go up, down, or stay the same. The RBI made sure that the data was representative of a wide range of demographic factors, such as gender, age, and income level, as well as a wide range of goods.

The questionnaire is meant to gather both types of data: qualitative and quantitative. The qualitative part looks at how respondents see general and specific price trends over the short and medium term. The quantitative part, on the other hand, wants to know the current inflation rate in numbers, as well as the expected inflation rate in three months and one year.

Inflation expectation surveys became more important around the world in the second half of the 20th century. India got into this area a little later, in 2005, but Indian households have responded strongly and thoughtfully. The RBI set up a Technical Advisory Committee on surveys in 2007 to make the survey process more structured and technically sound. This committee helped to regularly check the data that had been collected to see if it was reliable, consistent, and relevant to policy.

The committee's most important finding was that Indian households do not all consume the same way. Differences in culture, religion, education, lifestyle, and local economic conditions cause people to act differently in different parts of the country. This makes a one-size-fits-all monetary policy approach useless. In a country as diverse as India, it is important for policymakers to adapt inflation-targeting strategies to fit the needs of each area.

The RBI has always seen the household inflation expectation survey as an important part of making policy and has made improvements to it on a regular basis to make it more accurate and useful. Changes to the sample size, the sampling framework, and the forecast horizon are all part of these changes. These kinds of changes are meant to make estimates more detailed and specific, which will help policymakers make better decisions.

The 2009 RBI Internal Group Report said that the household survey project was a success. It suggested that the data be made public on the RBI's official website to encourage openness, raise public awareness, and build trust in the monetary policy framework. Even though the data might not fully reflect the consumption patterns of the whole population, making it available to households gives them more access to information, which could help them make better inflation predictions and financial plans.

Adding inflation expectations to macroeconomic analysis has been very helpful, especially when it comes to figuring out how people's perceptions affect their economic behaviour. The RBI's household survey is a good step in this direction because it gives policymakers timely and useful information and gets more people involved in the economy. The survey doesn't cover everything, but it does give us a good idea of how people feel about things, which is still a big part of how inflation works in India.

Table 1.1 shows a clear link between actual inflation and inflation expectations in India. A closer look shows that the two are very closely aligned, which means that people's expectations tend to follow actual price trends. The data shows that respondents consistently expect a higher rate of inflation in the short term (three months ahead) than in the long term (one year ahead). This shows that they think prices will rise more slowly over time. One interesting thing about the table is that the difference between expected and actual inflation keeps happening. Actual inflation numbers are usually lower than what people expect. This constant overestimation shows that households have a cautious optimism or inflationary bias. The difference between what people think inflation will be and what it actually is gives policymakers a lot of chances to learn more about how inflation expectations are formed and how to change them.

By focussing on the things that cause these expectations, like recent price trends, stories in the news, and local consumption patterns, policymakers can create measures that better anchor expectations. If households are told, in a clear and honest way, to expect lower inflation in the future, it could help keep actual inflation from going up too much.

Also, aligning policy changes with the main factors that affect household expectations can help close the gap between what people expect and what actually happens with inflation. Fixing this gap not only makes monetary policy more credible, but it also makes the way it spreads stronger. In the end, a better understanding of how people form inflation expectations and using this knowledge to shape policy can be very important for keeping inflation stable and promoting overall economic stability.

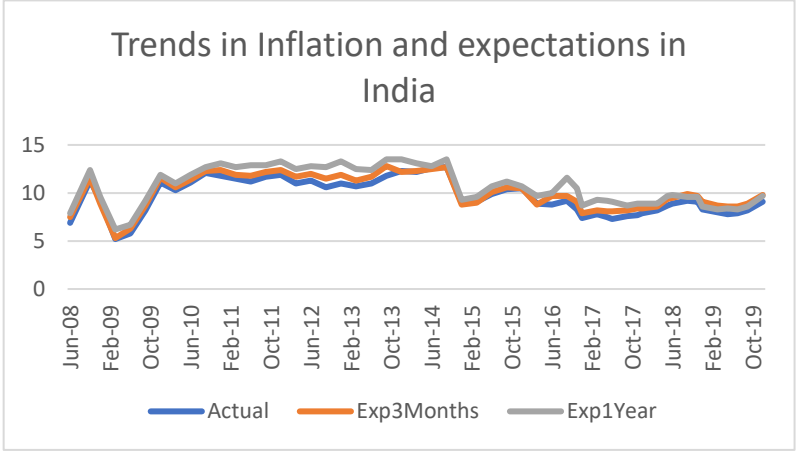
Table: 1.1 Quarterly Inflationary Expectations in India

Year	Quarter	No. of Respondents (Urban Households)	Cities covered	Expected three months ahead (Median, expressed in percentage)	Expected one year ahead (Median, expressed in percentage)	Actual (Median, said in percentage)
2008	June	4000	12	7.5	7.9	6.9
2008	October	4000	12	11.6	12.4	11.3
2008	December	4000	12	8.9	9.6	9.3
2009	March	4000	12	5.3	6.2	5.2
2009	June	4000	12	6.3	6.7	5.8
2009	September	4000	12	8.2	8.7	9.2
2009	December	4000	12	11.1	11.6	11.9
2010	March	4000	12	10.3	10.6	11.0
2010	June	4000	12	11.1	11.4	11.9
2010	September	4000	12	12.1	12.3	12.7

2010	December	4000	12	12.4	11.8	13.1
2011	March	4000	12	11.5	11.9	12.7
2011	June	4000	12	11.2	11.8	12.9
2011	September	4000	12	12.7	12.9	11.7
2011	December	4000	12	12.4	13.3	11.9
2012	March	4000	12	11.7	12.5	11.0
2012	June	4000	12	11.5	12.5	10.5
2012	September	4000	12	10.5	13.5	9.5
2012	December	5000	16	11.5	14.5	10.5
2013	March	5000	16	11.3	13.0	10.3
2013	June	4960	16	11.4	12.7	10.5
2013	September	4765	16	14.5	16.0	11.0
2013	December	4907	16	13.9	16.0	13.2
2014	March	4926	16	12.9	15.3	13.3
2014	July	4931	16	14.0	15.0	13.3
2014	September	4933	16	16.0	14.6	13.8
2014	December	5000	16	8.9	8.3	8.8
2015	March	4966	16	9.1	8.5	9.0
2015	June	4944	16	10.3	10.1	9.5
2015	September	4901	16	10.8	10.5	9.9
2015	December	4828	16	10.5	10.3	10.3
2016	March	5404	18	9.4	8.1	7.9
2016	June	5360	18	9.6	9.2	8.0
2016	September	5300	18	11.4	9.5	8.5
2016	November	5233	18	10.1	8.2	7.3
2016	December	5162	18	8.3	7.3	6.5
2017	March	5084	18	8.8	7.5	6.8
2017	May	4732	18	8.5	7.3	6.3
2017	June	4737	18	7.5	8.6	6.4
2017	September	4996	18	7.2	8.0	6.3
2017	November	5100	18	7.5	8.6	6.3
2017	December	5321	18	7.5	8.5	6.7
2018	March	5150	18	7.8	8.6	7.2
2018	May	5289	18	8.7	9.9	7.9
2018	June	5189	18	8.9	10.1	8.1
2018	September	5760	18	9.4	9.8	8.4
2018	November	5802	18	9.0	9.8	8.2
2018	December	5828	18	8.2	8.5	7.1
2019	March	5829	18	7.8	8.1	6.9
2019	May	5714	18	7.6	8.1	6.6
2019	July	5870	18	8.6	8.4	7.8
2019	September	5810	18	8.3	8.6	7.9
2019	December	5805	18	9.8	9.7	9.1

The base for the quarterly survey is individual consumption baskets.
Compiled by the author, data taken from RBI quarterly report on Inflationary Expectations in India

Figure 1 Trends in Inflation and its expectations in India (June 2008 to December 2019)



The line graph in the diagram shows how three important factors in the Indian economy have changed over time: the actual rate of inflation, inflation expectations three months from now, and inflation expectations one year from now. The blue line shows actual inflation, the orange line shows short-term expectations (three months ahead), and the grey line shows long-term expectations (one year ahead). The Reserve Bank of India (RBI) did a quarterly Inflation Expectations Survey of Households from March 2009 to December 2019. These data points come from that survey.

The graph shows that the three variables move together strongly, which means that inflation expectations closely follow actual inflation trends. This synchronisation gives us a strong basis in real life to say that inflation expectations are important for understanding and predicting price levels in the Indian economy. There is still a consistent gap between actual inflation and expected inflation, with expectations generally being higher. This difference shows how important it is to find and study the things that affect how households expect inflation to change.

Targeted policy changes that fill in these gaps can not only make inflation predictions more accurate, but they can also make monetary policy work better. This could help keep inflation expectations more stable and make price changes happen more smoothly across the economy if credible policy actions and better communication can help with this.

A regression analysis was done to see if the pattern seen in the overall data is also true for the people who answered the survey. We looked at how inflation expectations three months and one year ahead affected actual inflation. The results showed that both variables together explained a large part of the change in actual inflation.

The estimated beta coefficient was 0.984 when actual inflation was only based on expectations three months ahead. The beta coefficient was 0.960 when it was regressed on expectations for one year ahead. We did a regression of one-year-ahead expectations on three-months-ahead expectations to see if they are adaptive. The result was a beta coefficient of 0.969.

All of the regression coefficients were statistically significant, which strongly supports the theoretical literature that says inflation expectations play a big role in determining actual inflation outcomes. These results show that people base their decisions about current and future prices on their expectations, both those they have had recently and those they have in the future.

Table 1.2 shows descriptive statistics for the actual inflation rates and the two types of expectations that came from the quarterly household survey. These include the mean, number of observations, and standard deviation.

Table 1.3 shows the correlation matrix for the three variables: actual inflation, expectations three months from now, and expectations one year from now. The matrix shows that there is a strong linear relationship between actual inflation and expectations. The correlation coefficient between inflation that has already happened and expectations three months from now is 0.984. There is a 0.960 correlation between actual inflation and expectations for one year from now.

These results clearly show that there is a strong behavioural mechanism at work. Households make decisions based not only on how they think the economy is doing right now, but also on how they think things will be in the future based on their short-term expectations. This behaviour gives policymakers important information about how inflation works and how monetary policy spreads.

In a nutshell, the results show that inflation expectations have a real effect on inflation, which makes it even more important to include expectation management as a key part of India's inflation-targeting strategies.

Table 1.2: Descriptive statistics for regression of the actual inflation on its expectations

	Mean	Std. Deviation	N
Actual	9.5717	1.84019	53
Exp3months	10.0358	1.80118	53
Exp1year	10.6151	1.97371	53

Table 1.3: Correlation among actual inflation, expectations three months ahead and one year ahead

		Actual	Exp3months	Exp1year
Pearson Correlation	Actual	1.000	.984	.960
	Exp3months	.984	1.000	.969
	Exp1year	.960	.969	1.000
Sig. (1-tailed)	Actual	.	.000	.000
	Exp3months	.000	.	.000
	Exp1year	.000	.000	.
N	Actual	53	53	53
	Exp3months	53	53	53
	Exp1year	53	53	53

When actual inflation was compared to inflation expectations three months and one year in the future, the results of the regression seemed to be statistically strong for the sample data. The model summary for this regression is shown in Table 5.4 below. A close look at the summary, which shows how well the model fits the data, shows that people's expectations about future prices can explain about 97% of the total change in actual inflation. The model is very credible because it can explain so much.

At this point, it's not possible to separate the individual effects of the two explanatory variables (expectations three months ahead and one year ahead), but it's clear that they are both important. The adjusted R-squared stays high at 96.8%, even after taking into account the possibility of overfitting. This means that the model's ability to explain is not just a fluke.
The mean square residual (MSR) is also low at 0.328, which means that the model's residuals, or unexplained changes, are very small. The F-test, which was done to test the null hypothesis that the model's R-squared is equal to zero, is strongly rejected at the 5% level of significance. This adds to the model's reliability.
In short, the regression model can be thought of as statistically sound and a good way to look at the link between inflation expectations and actual inflation in India.

Table 1.4: Model summary for regression of the actual inflation on expectations three months ahead and one year ahead

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.985[a]	.969	.968	.32836	.969	791.557	2	50	.000

a. Predictors: (Constant), Exp1year, Exp3months

Table 1.5: ANOVA table with actual rate of inflation as the dependent variable.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	170.696	2	85.348	791.557	.000[a]
	Residual	5.391	50	.108		
	Total	176.088	52			

a. Predictors: (Constant), Exp1year, Exp3months

b. Dependent Variable: Actual

The analysis of variance (ANOVA) for the regression model in Table 1.5 shows how two predictors—inflation expectations three months ahead and one year ahead—can explain the actual inflation rate as reported by survey respondents. The table makes it clear that the regression model accounts for a large part of the total sum of squares, while the residual sum of squares stays low at 5.391. Also, the F-statistic's significance value is 0.000, which means that the model as a whole is statistically significant. This means that the two expectation variables, when looked at together, can be trusted to predict the actual inflation rate.
This analysis, on the other hand, does not show how important or strong each predictor is on its own. We need to do more research to find out how well the three-month and one-year expectation variables explain things on their own.

To see how well these variables can predict things, we start by only looking at how well expectations three months ahead can predict actual inflation. Table 1.6 shows the descriptive statistics—mean values, standard deviations, and number of observations—for both actual inflation and three-month-ahead expectations. These numbers come from the RBI's quarterly household inflation expectation surveys.

Table 1.7 also shows the correlation matrix between the two variables: actual inflation and expectations for the next three months. The results show a very strong positive linear relationship, with a correlation coefficient of 0.984. This means that short-term inflation expectations are very similar to what actually happens with inflation. This result supports the behavioural idea that people base their expectations on short-term price trends that they can see, which then affects how they think about current inflation.

Overall, these results strongly support the idea that short-term inflation expectations have a big impact on how people think about inflation and how it actually happens in India. The strength of this relationship shows how important expectations are in shaping macroeconomic dynamics and shows how important it is to include expectation management in the design and communication of monetary policy.

Table 1.6: Descriptive statistics for regression of actual inflation on expectations three months ahead

	Mean	Std. Deviation	N
Actual	9.5717	1.84019	53
Exp3months	10.0358	1.80118	53

Table 1.7: Correlation coefficient matrix on regressing actual inflation on expectations three months ahead

		Actual	**Exp3months**
Pearson Correlation	Actual	1.000	.984
	Exp3months	.984	1.000
Sig. (1-tailed)	Actual	.	.000
	Exp3months	.000	.
N	Actual	53	53
	Exp3months	53	53

When we looked at actual inflation data and inflation expectations three months ahead, the regression results were statistically strong and reliable for the sample we were looking at. The model summary for this regression analysis is shown in Table 1.8.

A close look at the model summary shows that about 96.9% of the total change in actual inflation can be explained by what people thought prices would be three months from now. This strong explanatory power makes the relationship very likely to be true. The adjusted R-squared stays high at 96.8%, even after taking into account the possibility of overfitting. This shows that the model is strong and that the results are not likely to be random.

The mean square residual (MSR) is also low at 0.327, which means that the model's unexplained variance is very small. At the 5% significance level, the F-test that was done to test the null hypothesis that the model does not explain any variation in actual inflation (i.e., $R^2 = 0$) is rejected. This further confirms the model's statistical significance.

In short, the regression model is a strong and dependable way to figure out how short-term inflation expectations and actual inflation are related. The results add more evidence to the broader theoretical claim that inflation expectations, especially in the short term, are a key factor in determining how inflation actually behaves in the Indian economy.

Table 1.8: Model summary for regression of the actual inflation on expectations three months ahead

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.984[a]	.969	.968	.32769	.969	1588.814	1	51	.000

a. Predictors: (Constant), Exp3months

Table 1.9: ANOVA table with actual rate of inflation as the dependent variable and expectations three months ahead as predictor

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	170.611	1	170.611	1.589E3	.000[a]
	Residual	5.477	51	.107		
	Total	176.088	52			

a. Predictors: (Constant), Exp3months

b. Dependent Variable: Actual

Table 1.9 shows the results of an analysis of variance (ANOVA) for the regression model that explains the actual inflation rate based only on what survey respondents thought would happen to prices over the next three months. The table shows that the model explains a large part of the total sum of squares, while the residual sum of squares stays low at 5.477. This means that the model works well with the data.

Also, the F-statistic's significance value is 0.000, which means that the regression model is statistically significant at the 5% level. In other words, what people think inflation will be like three months from now is a good way to guess what the actual inflation rate will be during the time period being looked at.

Table 1.10 shows the regression coefficients to help us better understand how strong this relationship is. According to the households, the results show that for every 1-unit rise in short-term inflation expectations, the actual inflation rate rises by about 0.984 units. This almost one-to-one match shows how well short-term expectations can predict the future.

We can write the estimated regression equation like this:

Actual = -.521 + .984Exp3Months + ξ

Where, -.521 is the constant term

ξ denotes the error term

The standard error terms also stand pretty low for the model inconsistency.

These results strongly support the idea that short-term inflation expectations are very similar to actual inflation outcomes. This means that they can be used as a reliable input for predicting inflation and making decisions about monetary policy.

Table 1.10: Coefficients on regressing actual inflation on expectations three months ahead

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.521	.257		-2.025	.048
	Exp3months	1.006	.025	.984	39.860	.000

a. Dependent Variable: Actual

Now we will regress actual inflation on the expectations reported one year ahead to see if long-term inflation expectations can accurately predict actual inflation as reported by respondents. Based on data from the Reserve Bank of India's quarterly household inflation expectations survey, Table 1.11 shows the descriptive statistics for both actual inflation and one-year-ahead expectations. These statistics include mean values, standard deviations, and the number of observations.

Table 1.12 also shows the correlation matrix between the two variables: actual inflation and expectations for one year ahead. There is a strong and positive linear relationship between them, as shown by the correlation coefficient of 0.960. This strong correlation supports the idea that long-term inflation expectations closely follow actual inflation trends over time.

These results provide solid evidence for the behavioural dynamics among households, who seem to base their current judgements and long-term expectations on the economic signals that are currently in place. This

relationship is strong enough to suggest that expectations for inflation one year from now are a good and useful way to predict actual inflation. This should be taken into account when designing monetary policy and inflation models.

Table 1.11: Descriptive statistics for regression of actual inflation on expectations one year ahead

	Mean	Std. Deviation	N
Actual	9.5717	1.84019	53
Exp1year	10.6151	1.97371	53

Table 1.12: Correlation coefficient matrix on regressing actual inflation on expectations one year ahead

		Actual	Exp1year
Pearson Correlation	Actual	1.000	.960
	Exp1year	.960	1.000
Sig. (1-tailed)	Actual	.	.000
	Exp1year	.000	.
N	Actual	53	53
	Exp1year	53	53

When actual inflation was compared to inflation expectations one year ahead, the regression results seemed to be statistically sound for the sample data. Table 1.13 shows the model summary, which gives us an idea of how well the regression model fits the data as a whole.

A close look at the summary shows that respondents' expectations of price changes one year ahead can explain about 92.1% of the total variation in actual inflation. This high level of explanatory power suggests that long-term expectations are based on solid evidence and are closely related to how inflation actually changes over time. The adjusted R-squared is still high at 91.9%, even after taking into account the possibility of overfitting. This means that the model is still strong even when it is penalised for extra variables or sample size issues.

The model's mean square residual (MSR) is only 0.5223, which means it fits well with little unexplained variance. The F-test, which tests the null hypothesis that the model doesn't explain any changes in actual inflation (i.e., $R^2 = 0$), is also rejected at the 5% level of significance. This shows that the link between actual inflation and expectations for the next year is not just a fluke; it is statistically significant.

To sum up, the regression model is very good at explaining things and is statistically sound. The results support the idea that expectations for inflation one year from now are a key factor in actual inflation. This makes them useful for both empirical modelling and making monetary policy that looks ahead.

Table 1.13: Model summary for regression of the actual inflation on expectations one year ahead

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.960[a]	.921	.919	.52253	.921	593.909	1	51	.000

a. Predictors: (Constant), Exp1year

Table 1.14: ANOVA table with actual rate of inflation as the dependent variable and expectations one year ahead as predictor

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	162.162	1	162.162	593.909	.000[a]
	Residual	13.925	51	.273		
	Total	176.088	52			

a. Predictors: (Constant), Exp1year

b. Dependent Variable: Actual

The analysis of variance (ANOVA) for the regression model is shown in Table 1.14. In this model, the respondents' expectations of price changes over the next year explain the actual inflation rate. The model

explains a large part of the total sum of squares, and the residual sum of squares is only about 13.925, which is a small amount. This means that the model fits pretty well.
The F-statistic's significance value is also 0.000, which means that the regression model is statistically significant at the 5% level. In other words, what people expect a year from now is a good way to guess what inflation will really be like.
Table 1.15 shows the estimated regression coefficients, which help us look more closely at how strong and in what direction the relationship is. According to the surveyed households, the actual inflation rate goes up by 0.960 units for every 1-unit rise in one-year-ahead expectations. The following is the estimated regression equation:
Actual = .074 + .960Exp1Year + ξ
Where, .074is the constant term
ξ denotes the error term
The coefficients have low standard errors, which means that the parameter estimates are accurate and the model is statistically consistent.
In short, the results show that there is a strong and statistically significant link between long-term inflation expectations and actual inflation. This makes it even more clear that including inflation expectations—especially over a one-year period—in models for predicting inflation and making monetary policy is a good idea.

Table 1.15: Coefficients on regressing actual inflation on expectations one year ahead

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.074	.396		.187	.852
	Exp1year	.895	.037	.960	24.370	.000

a. Dependent Variable: Actual

We use a regression analysis to see if the people who filled out our household survey form inflation expectations that change over time. We do this by comparing one-year-ahead inflation expectations to three-month-ahead expectations. This method helps figure out if short-term expectations have an effect on long-term expectations, which is a key part of adaptive expectations.
Table 1.16 shows the descriptive statistics, such as the mean values, standard deviations, and number of observations for expectations for one year and three months ahead. The Reserve Bank of India's Inflation Expectations Survey of Households collected the data that these numbers are based on.
Table 1.17 also shows the correlation matrix between the two variables: expectations for one year from now and expectations for three months from now. With a correlation coefficient of 0.969, the results show a very strong positive linear relationship. This high level of correlation suggests that people base their long-term views on inflation on their short-term expectations.
These results clearly show that Indian households adapt their behaviour to shape their expectations about inflation. The behavioural mechanism seems to involve projecting short-term price changes into the long term, which shows a tendency to base future expectations on what has happened recently.
In short, the results support the idea that short-term expectations have a big impact on inflation expectations, especially over the course of a year. This information is very important for policymakers who want to keep inflation expectations in check because it shows how important it is to stabilise short-term inflation perceptions in order to keep longer-term expectations in check.

Table 1.16: Descriptive statistics for regression of inflation expectations one year ahead on expectations three months ahead

	Mean	Std. Deviation	N
Exp1year	10.6151	1.97371	53
Exp3months	10.0358	1.80118	53

Table 1.17: Correlation coefficient matrix on regressing inflation expectations one year ahead on expectations three months ahead

		Exp1year	Exp3months
Pearson Correlation	Exp1year	1.000	.969
	Exp3months	.969	1.000
Sig. (1-tailed)	Exp1year	.	.000
	Exp3months	.000	.
N	Exp1year	53	53
	Exp3months	53	53

The regression results for one-year-ahead inflation expectations and three-month-ahead inflation expectations looked statistically sound and worked well with the sample data. Table 1.18 shows the model summary, which gives information about how well the regression model fits the data as a whole.

A close look at the table shows that about 94% of the total change in inflation expectations for the next year can be explained by what respondents expect to happen in the next three months. This shows that there is a strong and well-founded connection, which means that households may base their long-term expectations on their short-term ones. This is in line with the theory of adaptive expectations.

The adjusted R-squared stays high at 93.9%, even when taking into account the possibility of overfitting. This shows that the model is strong. The mean square residual (MSR) is also low at 0.488, which means that there isn't much unexplained variation.

Also, the F-test for the null hypothesis that the model's explanatory power is zero ($R^2 = 0$) fails at the 5% significance level, which shows that the model is statistically significant as a whole.

In short, the regression model shows that it can explain a lot and gives strong evidence that households change their behaviour. The results show that short-term inflation expectations are very important for shaping longer-term expectations. This has big effects on how inflation expectations are formed and how monetary policy should be communicated.

Table 1.18: Model summary for regression of the inflation expectations one year ahead on expectations three months ahead

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.969[a]	.940	.939	.48895	.940	796.323	1	51	.000

a. Predictors: (Constant), Exp3months

Table 1.19: ANOVA table with inflation expectations one year ahead as the dependent variable and expectations three months ahead as predictor

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	190.375	1	190.375	796.323	.000[a]
	Residual	12.192	51	.239		
	Total	202.568	52			

a. Predictors: (Constant), Exp3months

b. Dependent Variable: Exp1year

Table 1.19 shows the analysis of variance (ANOVA) for the regression model that explains one-year-ahead inflation expectations based on survey respondents' three-month-ahead expectations. The model explains a large part of the total variation, and the residual sum of squares is still low at about 12.192, which shows that the model fits well.

Table 1.20 also shows the F-statistic's significance value, which is 0.000. This means that the model is statistically significant at the 5% level. This means that the explanatory variable, three-month-ahead expectations, can reliably predict one-year-ahead inflation expectations. This supports the idea of an adaptive expectations formation process.

The table shows the regression coefficients, which tell us how important each predictor is. The results show that for every 1-unit rise in three-month-ahead expectations, there is a 0.969-unit rise in one-year-ahead expectations. We can write the estimated regression equation as:

Exp1Year = -.046 + .969Exp3Mon + ξ

Where, -.046 is the constant term

ξ denotes the error term

Also, the standard errors for the estimated parameters are fairly small, which shows that the model is very accurate and consistent.

In short, the results strongly suggest that households change their behaviour when they make inflation predictions. The fact that short- and long-term expectations are so similar shows how important it is to manage short-term inflation perceptions as a way to set future expectations and make monetary policy communication more effective.

Table 1.20: Coefficients on regressing expectations one year ahead on expectations three months ahead

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.046	.384		-.120	.905
	Exp3months	1.062	.038	.969	28.219	.000

a. Dependent Variable: Exp1year

The results of the regression analysis above make it clear that the way Indian households, as shown in the quarterly Inflation Expectations Survey, make their predictions about future price changes is flexible. Since the data used in this study is time series, it also ran unit root analysis tests to see if the data was stationary.

A unit root is a feature of a time series that makes its values follow a random trend, which makes them non-stationary and hard to predict. It is important to find a unit root to make sure that the results of a time series regression are correct. The Dickey-Fuller Test, the Phillips-Perron Test, and the Augmented Dickey-Fuller (ADF) Test are some of the most common tests that can be used for this.

This study used Microsoft Excel to check if the time series data on actual inflation and inflation expectations three months and one year ahead were stationary. The survey's reported numbers on actual inflation are shown in Table 1.21 below.

Table 1.21: Stationarity test on the actual inflation data collected from quarterly survey on inflationary expectations.

Time	Actual	Difference	Lag (1)	Lag(2)	Time Trend	Lagged
Mar-09	5.2					
Jun-09	5.8	0.6			1	5.2
Sep-09	8.2	2.4	0.6		2	5.8
Dec-09	11.1	2.9	2.4	0.6	3	8.2
Mar-10	10.3	-0.8	2.9	2.4	4	11.1
Jun-10	11.1	0.8	-0.8	2.9	5	10.3
Sep-10	12.1	1	0.8	-0.8	6	11.1
Dec-10	11.8	-0.3	1	0.8	7	12.1
Mar-11	11.5	-0.3	-0.3	1	8	11.8
Jun-11	11.2	-0.3	-0.3	-0.3	9	11.5
Sep-11	11.7	0.5	-0.3	-0.3	10	11.2
Dec-11	11.9	0.2	0.5	-0.3	11	11.7
Mar-12	11	-0.9	0.2	0.5	12	11.9
Jun-12	11.3	0.3	-0.9	0.2	13	11
Sep-12	10.6	-0.7	0.3	-0.9	14	11.3
Dec-12	11	0.4	-0.7	0.3	15	10.6
Mar-13	10.7	-0.3	0.4	-0.7	16	11
Jun-13	11	0.3	-0.3	0.4	17	10.7
Sep-13	11.8	0.8	0.3	-0.3	18	11
Dec-13	12.3	0.5	0.8	0.3	19	11.8
Mar-14	12.2	-0.1	0.5	0.8	20	12.3
Jun-14	12.6	0.4	-0.1	0.5	21	12.2
Sep-14	12.7	0.1	0.4	-0.1	22	12.6

Dec-14	9	-3.7	0.1	0.4	23	12.7
Mar-15	9.1	0.1	-3.7	0.1	24	9
Jun-15	9.9	0.8	0.1	-3.7	25	9.1
Sep-15	10.4	0.5	0.8	0.1	26	9.9
Dec-15	10.5	0.1	0.5	0.8	27	10.4
Mar-16	8.9	-1.6	0.1	0.5	28	10.5
Jun-16	8.8	-0.1	-1.6	0.1	29	8.9
Sep-16	9.2	0.4	-0.1	-1.6	30	8.8
Nov-16	8.3	-0.9	0.4	-0.1	31	9.2
Dec-16	7.4	-0.9	-0.9	0.4	32	8.3
Mar-17	7.8	0.4	-0.9	-0.9	33	7.4
May-17	7.5	-0.3	0.4	-0.9	34	7.8
Jun-17	7.3	-0.2	-0.3	0.4	35	7.5
Sep-17	7.6	0.3	-0.2	-0.3	36	7.3
Nov-17	7.7	0.1	0.3	-0.2	37	7.6
Dec-17	7.9	0.2	0.1	0.3	38	7.7
Mar-18	8.2	0.3	0.2	0.1	39	7.9
May-18	8.7	0.5	0.3	0.2	40	8.2
Jun-18	8.9	0.2	0.5	0.3	41	8.7
Sep-18	9.2	0.3	0.2	0.5	42	8.9
Nov-18	9.1	-0.1	0.3	0.2	43	9.2
Dec-18	8.3	-0.8	-0.1	0.3	44	9.1
Mar-19	8	-0.3	-0.8	-0.1	45	8.3
May-19	7.8	-0.2	-0.3	-0.8	46	8
Jul-19	7.9	0.1	-0.2	-0.3	47	7.8
Sep-19	8.2	0.3	0.1	-0.2	48	7.9
Dec-19	9.1	0.9	0.3	0.1	49	8.2

Table 1.22: Stationarity test on actual inflation data without drift

No drift	Coefficient	0.0015
	Standard Error	0.013614
	t-Stat	0.110168

Table 1.23: Stationarity test on actual inflation data with drift

Drift	Coefficient	-0.18377	1.844913
	Standard Error	0.067825	0.663364
	t-Stat	-2.70946	

Table 1.24: Stationarity test on actual inflation data with drift and trend

Drift + Trend	Coefficient	-0.28586	-0.02931	3.558332
	Standard Error	0.069339	0.009014	0.802055
	t-Stat	-4.12273		

Table 1.25: Results of Augmented Dickey Fuller Test with double lag on actual inflation data

Augmented (2 Lags)	Coefficient	-0.38865	-0.04112	-0.11398	0.134149	4.889362
	Standard Error	0.099666	0.012326	0.125732	0.124725	1.227637
	t-Stat	-3.8995				

Table 1.26: Critical values for Dickey Fuller test for stationarity

Dickey Fuller Critical Values	No Trend	Trend
1%	-3.43	-3.96
5%	-2.86	-3.41

The unit root test for stationarity in this study is based on the idea that people expect actual inflation to follow a pure random walk, which means there is a unit root. The alternative hypothesis, on the other hand, says that there is no unit root. This means that the people who answered the survey say that actual inflation follows a steady and predictable pattern.

The results of the regression analysis on the first difference of actual inflation and its lagged value, without the constant term, are shown in Table 1.22. The following is the regression equation that goes with it:

$\Delta Actual = \delta Actual_{t-1} + a_t$

Where Δ shows the difference and a_t shows the error term.

Once you get the estimated coefficient and compare it to the critical values from the Dickey-Fuller Test (see Table 1.26), it is clear that the null hypothesis is true at the 5% level of significance. This proves that the equation has a unit root, which means that the data is not stationary.

To solve this problem, different specifications have been looked into. The first one adds a constant term to the regression model. Table 1.23 shows the results of this changed specification. The new regression equation, with this change, is as follows:

$\Delta Actual = \theta_o + \delta Actual_{t-1} + a_t$

Where θ_o is the additional term explaining the constant in the equation.

A comparison of the results in Table 1.23 with the critical values provided in Table 5.26 clearly indicates that the null hypothesis continues to be accepted. This confirms the persistence of a unit root, and consequently, the data remains non-stationary. As a result, the dataset, in its current form, cannot yet be considered reliable for further analysis.

To address this, the next step involves testing for the presence of both drift and trend in the variable. The revised regression equation for this specification is as follows:

$\Delta Actual = \theta_o + \phi t + \delta Actual_{t-1} + a_t$

Where θ_o is the additional term explaining the constant in the equation and another term is added in order to look for the time trend. The results for the regression analysis for the same are shown in table 1.24 where clearly the estimated value 3.558332 lie in the rejection region of the critical area of the Dickey Fuller test when compared from table 1.26. Hence, the null seems to be rejected and there exists no unit root in the data anymore and the data may now be considered as a reliable one. Just in order to be double sure, the research study also conducts an augmented Dickey Fuller test with two period lags in order to check for drift and time trend and the results for the same are presented in the table 1.25. The calculated value for the coefficient 4.889 is clearly in the rejected region for the critical values for the test and hence the null supporting presence of the unit root stands rejected and the data has now been made fit for further analysis.

Once the data on actual inflation has been evaluated for stationarity, the next step in the current objective is to look for stationarity in the reported expectations of people three months ahead in the quarterly survey of RBI on inflationary expectations. The following table 1.27 details out the data for the same.

Table 1.27: Data to check for stationarity in expectations three months ahead

Time	3Months Ahead	Difference	Lag (1)	Lag(2)	Time Trend	Lagged
Mar-09	5.3					
Jun-09	6.3	1			1	5.3
Sep-09	8.7	2.4	1		2	6.3
Dec-09	11.6	2.9	2.4	1	3	8.7
Mar-10	10.6	-1	2.9	2.4	4	11.6
Jun-10	11.4	0.8	-1	2.9	5	10.6
Sep-10	12.3	0.9	0.8	-1	6	11.4
Dec-10	12.4	0.1	0.9	0.8	7	12.3
Mar-11	11.9	-0.5	0.1	0.9	8	12.4
Jun-11	11.8	-0.1	-0.5	0.1	9	11.9
Sep-11	12.2	0.4	-0.1	-0.5	10	11.8
Dec-11	12.4	0.2	0.4	-0.1	11	12.2
Mar-12	11.7	-0.7	0.2	0.4	12	12.4
Jun-12	12	0.3	-0.7	0.2	13	11.7
Sep-12	11.5	-0.5	0.3	-0.7	14	12
Dec-12	11.9	0.4	-0.5	0.3	15	11.5
Mar-13	11.3	-0.6	0.4	-0.5	16	11.9
Jun-13	11.7	0.4	-0.6	0.4	17	11.3
Sep-13	12.8	1.1	0.4	-0.6	18	11.7
Dec-13	12.2	-0.6	1.1	0.4	19	12.8
Mar-14	12.3	0.1	-0.6	1.1	20	12.2
Jun-14	12.5	0.2	0.1	-0.6	21	12.3
Sep-14	12.7	0.2	0.2	0.1	22	12.5
Dec-14	8.8	-3.9	0.2	0.2	23	12.7
Mar-15	9	0.2	-3.9	0.2	24	8.8
Jun-15	10.1	1.1	0.2	-3.9	25	9
Sep-15	10.6	0.5	1.1	0.2	26	10.1
Dec-15	10.5	-0.1	0.5	1.1	27	10.6
Mar-16	8.8	-1.7	-0.1	0.5	28	10.5
Jun-16	9.7	0.9	-1.7	-0.1	29	8.8
Sep-16	9.7	0	0.9	-1.7	30	9.7

Nov-16	9.1	-0.6	0	0.9	31	9.7
Dec-16	7.9	-1.2	-0.6	0	32	9.1
Mar-17	8.2	0.3	-1.2	-0.6	33	7.9
May-17	8.1	-0.1	0.3	-1.2	34	8.2
Jun-17	8.1	0	-0.1	0.3	35	8.1
Sep-17	8.2	0.1	0	-0.1	36	8.1
Nov-17	8.4	0.2	0.1	0	37	8.2
Dec-17	8.4	0	0.2	0.1	38	8.4
Mar-18	8.6	0.2	0	0.2	39	8.4
May-18	9.4	0.8	0.2	0	40	8.6
Jun-18	9.5	0.1	0.8	0.2	41	9.4
Sep-18	9.9	0.4	0.1	0.8	42	9.5
Nov-18	9.7	-0.2	0.4	0.1	43	9.9
Dec-18	9.1	-0.6	-0.2	0.4	44	9.7
Mar-19	8.7	-0.4	-0.6	-0.2	45	9.1
May-19	8.6	-0.1	-0.4	-0.6	46	8.7
Jul-19	8.6	0	-0.1	-0.4	47	8.6
Sep-19	8.9	0.3	0	-0.1	48	8.6
Dec-19	9.8	0.9	0.3	0	49	8.9

Table 1.28: Stationarity test on inflation expectations three months ahead data without drift

No drift	Coefficient	0.002139782
(Pure random walk)	Standard Error	0.013642668
we are regressing difference on lagged variable	t-Stat	0.156844847

Table 1.29: Stationarity test on inflation expectations three months ahead data with drift

Drift	Coefficient	-0.21706886	2.280688223
	Standard Error	0.071521535	0.732572045
	t-Stat	-3.03501396	

Table 1.30: Stationarity test on inflation expectations three months data with drift and trend

Drift + Trend	Coefficient	-0.31536188	-0.02974086	4.015364417
	Standard Error	0.071811774	0.009128825	0.853833891
	t-Stat	-4.39150665		

Table 1.31: Results of Augmented Dickey Fuller Test with double lag on expectations three months ahead

Augmented (2 Lags)	Coefficient	-0.43323405	-0.04340949	-0.121897204	0.074851096	5.60403129
	Standard Error	0.107117551	0.012672934	0.124450108	0.124744642	1.35450419
	t-Stat	-4.04447312				

The unit root test for stationarity in the current study assumes that there exists pure random walk in the way how people anticipate inflation three months ahead and hence there is a presence of unit root. However, the alternative hypothesis assumes absence of the unit root leading to a certain sustained pattern of inflationary expectations three months ahead being reported by people. Table 1.28 shows the result of regression analysis being undertaken on the first difference on the inflation expectations three months ahead and that of the lagged value without the constant term. The equation form for the same is:

$\Delta Exp3Mon = \delta Exp3Mon_{t-1} + a_t$

Where Δ shows the difference and a_t shows the error term.

Once the value of coefficient obtained and is compared with the critical Dickey Fuller Test values presented in table 1.26, one may easily ascertain that the null hypothesis seems to be accepted at five per cent level of confidence and hence there exists a unit root for this equation form leading to non-stationarity in the data. Consequently, alternative measures have been taken in order to resolve the issue, first of them being inclusion of the constant term. The results for it have been presented in the table 1.23. Now the equation for the data analysis becomes:

$\Delta Exp3Mon = \theta_o + \delta Exp3Mon_{t-1} + a_t$

Where θ_o is the additional term explaining the constant in the equation.

While we compare results in table 1.29 with that of the critical values presented in the table 1.26, we clearly see that the null still seems to be accepted explaining presence of the unit root and hence non-stationarity in the data. As a result, the data set we have so far can yet not be considered a reliable one. So, we will now further check for both drift and trend in the variable. For which the new equation form is:

$\Delta Exp3Mon = \theta_o + \phi t + \delta Exp3Mon_{t-1} + a_t$

Where θ_o is the additional term explaining the constant in the equation and another term is added in order to look for the time trend. The results for the regression analysis for the same are shown in table 1.30 where clearly the estimated value 4.0153 lie in the rejection region of the critical area of the Dickey Fuller test when compared from table 1.26. Hence, the null seems to be rejected and there exists no unit root in the data anymore and the data may now be considered as a reliable one. Just in order to be double sure, the research study also conducts an augmented Dickey Fuller test with two period lags in order to check for drift and time trend and the results for the same are presented in the table 1.31. The calculated value for the coefficient 5.60403 is clearly in the rejected region for the critical values for the test and hence the null supporting presence of the unit root stands rejected and the data has now been made fit for further analysis. Also, the mean square errors in all the cases were pretty low to be considered significantly problematic and dealt with.

The last step to deal with the stationarity in the data is to look out on it in the reported expectations of people one year ahead in the quarterly survey of RBI on inflationary expectations. The following table 1.32 details out the data for the same.

Table 1.32: Data to check for stationarity in expectations one year ahead

Time	I year Ahead	Difference	Lag (1)	Lag(2)	Time Trend	Lagged
Mar-09	6.2					
Jun-09	6.7	0.5			1	6.2
Sep-09	9.2	2.5	0.5		2	6.7
Dec-09	11.9	2.7	2.5	0.5	3	9.2
Mar-10	11	-0.9	2.7	2.5	4	11.9
Jun-10	11.9	0.9	-0.9	2.7	5	11
Sep-10	12.7	0.8	0.9	-0.9	6	11.9
Dec-10	13.1	0.4	0.8	0.9	7	12.7
Mar-11	12.7	-0.4	0.4	0.8	8	13.1
Jun-11	12.9	0.2	-0.4	0.4	9	12.7
Sep-11	12.9	0	0.2	-0.4	10	12.9
Dec-11	13.3	0.4	0	0.2	11	12.9
Mar-12	12.5	-0.8	0.4	0	12	13.3
Jun-12	12.8	0.3	-0.8	0.4	13	12.5
Sep-12	12.7	-0.1	0.3	-0.8	14	12.8
Dec-12	13.3	0.6	-0.1	0.3	15	12.7
Mar-13	12.5	-0.8	0.6	-0.1	16	13.3
Jun-13	12.4	-0.1	-0.8	0.6	17	12.5
Sep-13	13.5	1.1	-0.1	-0.8	18	12.4
Dec-13	13.5	0	1.1	-0.1	19	13.5
Mar-14	13.1	-0.4	0	1.1	20	13.5
Jun-14	12.8	-0.3	-0.4	0	21	13.1
Sep-14	13.5	0.7	-0.3	-0.4	22	12.8
Dec-14	9.3	-4.2	0.7	-0.3	23	13.5
Mar-15	9.6	0.3	-4.2	0.7	24	9.3
Jun-15	10.7	1.1	0.3	-4.2	25	9.6
Sep-15	11.2	0.5	1.1	0.3	26	10.7
Dec-15	10.7	-0.5	0.5	1.1	27	11.2
Mar-16	9.7	-1	-0.5	0.5	28	10.7
Jun-16	10	0.3	-1	-0.5	29	9.7
Sep-16	11.6	1.6	0.3	-1	30	10
Nov-16	10.5	-1.1	1.6	0.3	31	11.6
Dec-16	8.7	-1.8	-1.1	1.6	32	10.5
Mar-17	9.3	0.6	-1.8	-1.1	33	8.7
May-17	9.2	-0.1	0.6	-1.8	34	9.3
Jun-17	9.1	-0.1	-0.1	0.6	35	9.2
Sep-17	8.7	-0.4	-0.1	-0.1	36	9.1
Nov-17	8.9	0.2	-0.4	-0.1	37	8.7
Dec-17	8.9	0	0.2	-0.4	38	8.9
Mar-18	8.9	0	0	0.2	39	8.9

May-18	9.7	0.8	0	0	40	8.9
Jun-18	9.8	0.1	0.8	0	41	9.7
Sep-18	9.6	-0.2	0.1	0.8	42	9.8
Nov-18	9.6	0	-0.2	0.1	43	9.6
Dec-18	8.6	-1	0	-0.2	44	9.6
Mar-19	8.3	-0.3	-1	0	45	8.6
May-19	8.4	0.1	-0.3	-1	46	8.3
Jul-19	8.3	-0.1	0.1	-0.3	47	8.4
Sep-19	8.6	0.3	-0.1	0.1	48	8.3
Dec-19	9.7	1.1	0.3	-0.1	49	8.6

Table 1.33: Stationarity test on inflation expectations one year ahead data without drift

No drift	Coefficient	0.00036
	Standard Error	0.01363
	t-Stat	0.02643

Table 1.34: Stationarity test on inflation expectations one year ahead data with drift

Drift	Coefficient	-0.1857	2.05342
	Standard Error	0.07075	0.76785
	t-Stat	-2.6248	

Table 1.35: Stationarity test on inflation expectations one year ahead data with drift and trend

Drift + Trend	Coefficient	-0.3114	-0.0353	4.27749
	Standard Error	0.07338	0.01022	0.94486
	t-Stat	-4.2437		

Table 1.36: Results of Augmented Dickey Fuller Test with double lag on expectations one year ahead

Augmented (2 Lags)	Coefficient	-0.4759	-0.0606	-0.2243	-0.0018	6.76286
	Standard Error	0.10317	0.0139	0.11881	0.11845	1.41434
	t-Stat	-4.6133				

The unit root test for stationarity in the current study assumes that there exists pure random walk in the way how people anticipate inflation one year ahead and hence there is a presence of unit root. However, the alternative hypothesis assumes absence of the unit root leading to a certain sustained pattern of inflationary expectations one year ahead being reported by people. Table 1.33 shows the result of regression analysis being undertaken on the first difference on the inflation expectations one year ahead and that of the lagged value without the constant term. The equation form for the same is:

$\Delta Exp1Year = \delta Exp1Year_{t-1} + a_t$

`Where Δ shows the difference and a_t shows the error term.

Once the value of coefficient obtained and is compared with the critical Dickey Fuller Test values presented in table 1.26, one may easily ascertain that the null hypothesis seems to be accepted at five per cent level of confidence and hence there exists a unit root for this equation form leading to non-stationarity in the data. Consequently, alternative measures have been taken in order to resolve the issue, first of them being inclusion of the constant term. The results for it have been presented in the table 1.34. Now the equation for the data analysis becomes:

$\Delta Exp1Year = \theta_o + \delta Exp1Year_{t-1} + a_t$

Where θ_o is the additional term explaining the constant in the equation.

While we compare results in table 1.35 with that of the critical values presented in the table 1.26, we clearly see that the null still seems to be accepted explaining presence of the unit root and hence non-stationarity in the data. As a result, the data set we have so far can yet not be considered a reliable one. So, we will now further check for both drift and trend in the variable. For which the new equation form is:

$\Delta Exp3Mon = \theta_o + \phi t + \delta Exp1Year_{t-1} + a_t$

Where θ_o is the additional term explaining the constant in the equation and another term is added in order to look for the time trend. The results for the regression analysis for the same is shown in table 1.36 where clearly the estimated value 4.0153 lie in the rejection region of the critical area of the Dickey Fuller test when compared from table 1.26. Hence, the null seems to be rejected and there exists no unit root in the data anymore and the data may now be considered as a reliable one. Just in order to be double sure, the research study also conducts an augmented Dickey Fuller test with two period lags in order to check for drift and time trend and the results for the same are presented in the table 1.36. The calculated value for the coefficient 5.60403 is clearly in the rejected region for the critical values for the test and hence the null supporting presence of the unit root stands

rejected and the data has now been made fit for further analysis. Also, the mean square errors in all the cases were pretty low to be considered significantly problematic and dealt with.

Once the trend for Indian inflation data with that of its expectations made by people for three months ahead and one year ahead has been analysed and the relevance of the expectations to check the actual inflation has been established, it opens doors for the policymakers to look out for the factors that help these households actually anchor their expectations. This will further help the policymakers to keep these factors tamed thereby putting out the direct measures to manage these ingredients that will help the macro management of the country via both the channels. Firstly it, will help in a more concrete base for functioning of both the monetary and fiscal markets and secondly, it will keep the rate of inflationary expectations formed by people in control so that the actual inflation can easily be administered.

Conclusion

The research study deals with assessing the role played by inflationary expectations in explaining the actual price trends in the economy deals with the secondary data. The Reserve Bank of India collected data for this study through its Quarterly Survey of Inflation Expectations. This dataset shows how actual inflation rates and inflation expectations three months and one year ahead move together, as reported by households. The strong link between these variables makes it possible to say that inflation expectations are important for understanding and keeping an eye on price levels in the country.

But there is still a gap between the actual inflation rates and the expected rates. This difference shows how important it is to find out what factors shape people's expectations about how prices will change in the future. By understanding these factors and creating targeted policy changes to affect them, we can help make inflation more stable and predictable. These steps would not only make monetary policy work better, but they would also help close the gap between what people think will happen with inflation and what actually happens.

Policymakers have a great chance to do something important after figuring out the trend patterns in Indian inflation and its short-term and long-term expectations, and confirming that these expectations can be used to predict actual inflation. This means figuring out what factors keep households' inflation expectations stable and how they work. By understanding these factors, policymakers can come up with ways to deal with them before they happen. This two-pronged approach, which deals with both real inflation and the psychological and economic factors that shape expectations, makes macroeconomic management as a whole stronger.

In more detail, this has two important policy implications. First, it helps build a stronger base for making decisions about money and taxes. Second, it's easier to keep actual inflation on the right track when inflation expectations are well-anchored and within manageable limits. So, learning more about how expectations are formed not only helps inflation targeting frameworks, but it also makes the economy as a whole more stable.

References

1. Singh, Manmohan (2011), Inflation a threat, https://www.bbc.com/news/business-12363201
2. Vajpayee (2000), India Policies to Reduce Poverty and Accelerate Sustainable Development, Report 19471-IN, Poverty Reduction and Economic Management Unit, South Asia Region, World Bank, Jan 31, 2000.
3. Gokarn, Subir (2011), Food Inflation-this time its different, Text of the Kale Memorial Lecture, Gokhale Institute of Politics and Economics, Pune, Dec 9, 2011.
4. Rajan, Raghuram (2014), Fighting Inflation, FIMMDA-PDAI Annual Conference 2014, Mumbai, Feb 26, 2014
5. Bhalla, Surjit, (2014a), Why Monetary Policy is irrelevant, Indian Express, Sept 20, 2014
6. Lahiri, Amartya (2014), Don't Blame MSP for inflation, Indian Express, Oct 7, 2014
7. Raj, Janak and Misra, Sangita (2011), Measures of Core Inflation in India, Reserve Bank of India Occasional Papers, Vol. 32. No. 3, Winter 2011
8. Clark, T (2002), A Simple Adaptive Inflation, Journal of Money, 43(1), 94-113
9. Kenton, Will (2019), Headline Inflation, Investopedia, Jan 26, 2021
10. Ball, L., & Mankiw, N. (2002). The NAIRU in Theory and Practice. The Journal of Economic Perspectives, 16(4), 115-136. Retrieved June 30, 2021
11. Loungani, Prakash and Swagel, Phillip (2001), Sources of Inflation in Developing Countries, IMF Working Paper Series, Dec, 2001
12. Brahamananda, P. and Nagaraju, G. (2002), Inflation and Growth In the World: Some Simple empirics, 1970-99, Macroeconomics and Monetary Policy: Issues for a reforming economy, Oxford University Press, New Delhi, 43-66
13. Callen, T. and Chang, D. (1999), Modeling and forecasting inflation in India. IMF Working Paper No. 99/119, Washington: International Monetary Fund.
14. Yale Insights, How does Inflation change Consumer Behaviour
15. Bhattacharya, B.B. Sharma (1985), Relationship between Money and Prices in India: Some evidence from bivariate causality tests, Journal of Quantitative Economics, 1, 285-98

16. Singh, B. (1989). Money supply-prices: Causality revisited. Economic and Political Weekly, 24(47), 2613–15
17. Quarterly Survey on Inflationary Expectations, Reserve Bank of India
18. Balakrishnan, P. (1991), Pricing and Inflation in India, Delhi Oxford University Press.
19. Nachane, D. and R. Lakshmi, (2002): Dynamics of Inflation in India-a P-Star Approach, Applied Economics, 34, 101-110.
20. Paul. B. (2009), In Search of the Phillips Curve for India, Journal of Asian Economics 20(4), Dec, 2009.
21. Dua, P., and U. Gaur (2009): "Determination of Inflation in an Open Economy Phillips Curve Framework: The Case of Developed and Developing Asian Countries," Centre for Development Economics Working Paper.
22. T. Jolly, Indapurkar, K, "Demonetisation and its Implementation in Financial Reformation", Business Sciences Research Journal, 2018
23. Srinivasan, N., Mahambare, V., and M. Ramachandra (2006): "Modeling Inflation in India: Critique of the Structuralist Approach," Journal of Quantitative Economics, New Series 4, 45-58.
24. John, Rijo M. (2003), Inflation in India: An Analysis Using Post-Liberalisation Data, Oct, 2003.
25. Pattnaik, R.K., Samantaraya, A. (2006). Indian experience of inflation: A review of the evolving process. Economic and Political Weekly, 41(4), 349–57
26. T. Jolly, Indapurkar, K, "An Analytical study on inflationary expectations with references to the evidence from the world", International Journal of Advanced Science and Technology
27. Patnaik, Ila, Shah, Ajay and Veronese, G. (2011), How to measure inflation in India?, Working Paper, 2011-83, NIPFP, Feb, 2011