

Forecasting Atta Prices in East India to Optimize Buying and Selling

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Introduction About Myself:

My name is Yogya Hridey Sareen, and I am a third-year student pursuing a BA (Hons) in Economics with a minor in Computer Science at Ashoka University. I am interested in pursuing a career in data science and am currently working towards building my skillset for the same. My interests lie in perspective analytics.

Objective:

This exercise's main goal is to help sellers maximise their profits by determining which areas in India's east zone have the lowest wholesale prices for atta purchases and the highest retail prices for atta sales. The east zone of India consists of the states of Bihar, Jharkhand, Odisha, and West Bengal. This approach can be expanded to other products and regions of the country, guaranteeing sellers the highest possible profit margin.

Motivation:

By accurately forecasting the retail and wholesale prices of atta across various markets in the east zone, sellers can make informed decisions about where to purchase their inventory at the lowest possible wholesale price and where to sell it at the highest possible retail price. This strategy allows them to maximise their profit margins and gain a competitive advantage in the market.

Additionally, reliable price forecasts can help sellers plan their inventory management, logistics, and marketing strategies more effectively, ultimately leading to increased operational efficiency and profitability.

Methodology:

To achieve this objective, we employ the Autoregressive Moving Average (ARMA) model, a widely used statistical technique for forecasting time series data. The ARMA model combines two components: the Autoregressive (AR) component, which captures the dependence of a variable on its own past values, and the Moving Average (MA) component, which accounts for the influence of past error terms on the current value of the variable.

Data:

The data has been obtained from [CEDA's Daily Food Price Data Tracker](#). It contains values of wholesale and retail prices of atta (wheat) from states in the east zone of India from 2014 to the present.

Forecasting Process:

1. **Data Preparation:** The historical price data is preprocessed to handle missing values, outliers, and any other data quality issues that may affect the accuracy of the forecasts.
2. **Model Identification:** The appropriate orders of the AR and MA components were determined by employing information criteria like the Akaike Information Criterion (AIC) or the Bayesian Information Criterion (BIC).
3. **Model Estimation:** Once the orders of the AR and MA components had been identified, the parameters of the ARMA model were estimated using methods like maximum likelihood estimation or conditional least squares.
4. **Forecasting:** If the model diagnostics were satisfactory, the ARMA model was used to generate forecasts for future retail and wholesale prices of atta in different markets within the east zone of India.

Results:

