Original Research Article

Price Behaviour of Eggs in Selected Markets of India

ABSTRACT

The present study entitled “Price Behaviour of Eggs in Selected Markets of India” aims to study various components of prices of eggs in selected markets of India. Decomposition of prices of eggs to trend, seasonal cyclical and irregular components was done using Minitab. The data on egg prices from June 2009 to May 2022 was obtained from National Egg Coordination Committee (NECC) website. Bengaluru, Chennai, Delhi and Mumbai are the four markets considered for the study. The average price per 100 eggs is highest in Mumbai (Rs.366.06) followed by Chennai (Rs.360.25), Bengaluru (Rs.348.52) and Delhi (Rs.341.17). the prices of eggs showed wide fluctuations and there is uniformity in prices of eggs across all the selected markets due to organized egg marketing. The prices of eggs in all the selected markets showed a highly significant increasing trend. The annual increase in egg prices was highest in Mumbai market (Rs.1.57/100 eggs) and lowest in Delhi market (Rs.1.35/100 eggs). Highest seasonal index was observed during the month of June in Bengaluru and Chennai markets and guring the month of July in Delhi and Mumbai markets. In the month of April, the prices of eggs decreased due to their short shelf life because of summer whereas in the month of November the prices of eggs decreased due to increase in arrivals of eggs. Highest price of eggs during June and July months is due to increase in consumption of eggs. Egg prices do not have any price cycles and irregular variations are observed for all the markets considered under study.

Keywords: Eggs, Trend, Seasonal, Cyclical, Irregular

1. INTRODUCTION

Poultry is one of the major segments in agricultural sector of India that is growing at a fastest rate than that of agricultural crops. Poultry production increased enormously for the past four decades due to an increase in commercial production systems as well as technological advancement. The quality and productivity of poultry have improved a lot. Usage of standardized package of practices and development of high yielding layers and broilers contributed to the growth in poultry production.[1]

Changing food habits and increasing income levels create demand for poultry products. Percapita consumption of poultry products increased in the recent past. During the recent

years COVID-19 posed a problem for poultry sector and consumption of poultry products decreased in the year 2020.

India is one of the leading egg-producing countries in the world. Egg production in India increased from 95 billion eggs in 2017-218 to over 114 billion eggs in 2019-20 and is expected to reach 136 billion eggs by 2023 whereas poultry meat production increased from 3.7 MMT in 2017-18 to 4.3 MMT in 2019-20 and is expected to increase to 6.2 MMT by 2023. Poultry products in India have good export potential. Oman, Maldives, Russia, Vietnam and Indonesia are major importers of poultry products from India[2]. Andhra Pradesh, Tamil Nadu, Maharashtra, Punjab and Kerala are major egg-producing states in India.

Egg is a nutritious food consisting of protein, essential amino acids, vitamins such as vitamin A, B6, B12, folate, minerals such as iron, phosphorus, Selenium, Choline and zinc etc. which are crucial for growth and provide good health. Egg provides many health benefits to people of all age groups. It reduces the risk of blindness and cataract in people over an age of 65.

Some of the related literature are presented here.

Yuhuan and Fu [3] analysed price fluctuations of egg in China and determine the impact of egg price on profit of egg producers. The reasons for decrease in egg prices are size of layer farms, breeding cost, information technology and the government's environmental protection policy and less consumer disposable income. Some of the suggestions proposed for layer breeding are egg branding operation, pay attention to egg safety and grasp the market situation. Suggestions for farmers are to actively following market trens taking suitable decisions, reduce the loss of spot price volatility and make full use of modern science and technology

Karthikeyan and Nedunchezhian[4] analysed price trends and behavioral patterns of eggs. The data collected for a period of 4 years i.e., from January 2009 to December 2012. According to the results the average egg prices grown significantly at 28% during the study period. This is due to increase in consumption of eggs and increase in feed cost. The consumption of egg is high during winter which in turn increases prices of eggs. The prices of egg also increases in November and December when demand is high i.e., during Christmas and new year. Lowest price in April due to hot climate.

Akintola and Adebayo [5] studied sesonality of market prices of livestock products in Ibadan Metropolis. Monthly prices of beef, chicken, egg and milk for a period 72 months were collected i.e., from 1992 to 1997.Results revealed that highest prices are recorded during festivals. Storage, Transportation improved market structures are recommended in order to stabilize livestock prices.

Sarkar et al[6] analyzed behaviour of market arrivals and prices of mustard in West Bengal. Arrivals are highest during March in Bardhaman, Chakdah and Tufanganj and during February in Bankura and Kandi. Prices are at peak when arrivals are less. The study suggest the government to devise suitable agricultural price policy

Areef et al[7] studied the price behaviour of onion in Kurnool market.Data fromJanuary 20003 to December 2017 were analysed and annual increase of onion prices of Rs. 6.22 per quintal per annum was observed. The highest and lowest seasonal indices were observed in August and May respectively.

2. METHODOLOGY

2.1 Markets selected for the study

Bengaluru, Chennai, Delhi and Mumbai were the four markets that have been selected for the study.

2.2 Nature and Sources of data

Secondary data is used for analysis in the present study. The data on egg prices from June 2009 to May 2022 was obtained from National Egg Coordination Committee(NECC) website.

2.3 Time series decomposition

Decomposition of time series to set of components that can be associated to various types of temporal variations is the main aim of time series analysis. Time series decomposition is a very old concept. According to Persons[8] the time series is composed of four types of fluctuations.

(1) Secular trend: Time series show tendency of increase or decrease over a long period of time

(2) **Cyclical movements** super-imposed upon the long-term trend. These cycles appear to reach their peaks during periods of industrial prosperity and their troughs during periods of depressions, their rise and fall constituting the business- cycle.

(3) A **seasonal movement** within each year, may be due to customs, climate etc.,

(4) **Irregular variations** occur due to changes impacting individual variables or other major events such as wars and national catastrophes affecting a number of variables.[9]

If the four components of time series are dependent then the relationship can be specified as multiplicative model

$$X_t = T_t C_t S_t I_t \text{----------(1)}$$

Where, Xt denotes the observed series,

T_t denotes the long-term trend,

C_t denotes the business-cycle,

S_t denotes seasonality and

I_t denotes irregular.

3. RESULTS AND DISCUSSION

3.1 Price movement of eggs -The fluctuations in prices of eggs in selected markets of India are observed with the help of graphs. Among all the selected markets the average price of 100 eggs is highest in Mumbai (Rs.366.06) followed by Chennai (Rs.360.25), Bengaluru (Rs.348.52) and Delhi (Rs.341.17) during the period considered under study. There is uniformity in prices of eggs across all the selected markets due to organized egg marketing.

3.1.1 Price movement of eggs in Bengaluru: The fluctuations in prices of eggs in Bengaluru are depicted in Fig.1. The egg prices in Bengaluru showed wide fluctuations during the entire period considered under study. The price per 100 eggs is least during the month of August 2009 i.e.,Rs.205.58 and highest during the month of June 2021 i.e., Rs.537.17. The average price per 100 eggs for the entire period considered under study is Rs.348.52.

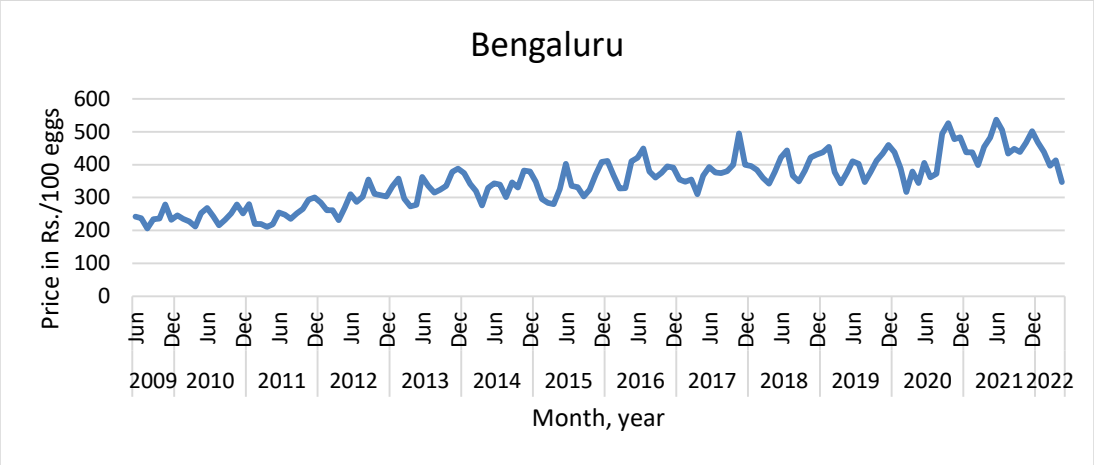

Fig.1 Prices of eggs in Bengaluru

3.1.2 Price movement of eggs in Chennai: The variations in prices of eggs in Chennai are portrayed in Fig.2. Wide fluctuations were observed in egg prices in Chennai ranging from Rs.217.65 in August 2009 to Rs.532.50 in June,2021. Average price of eggs in Chennai during the study period is Rs.360.25 per 100 eggs.

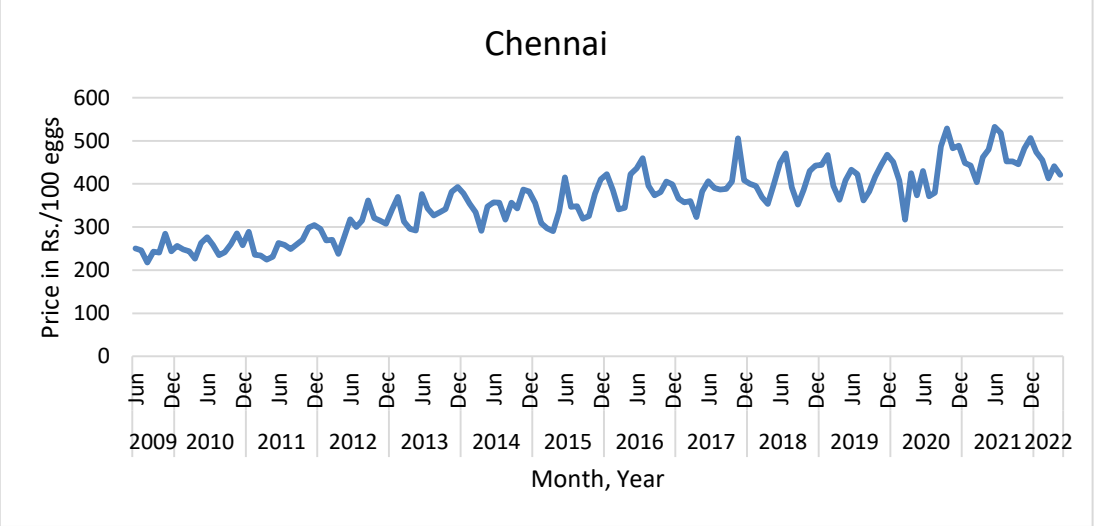

Fig.2 Prices of eggs in Chennai

3.1.3 Price movement of eggs in Delhi: The prices of eggs in Delhi market are depicted in Fig.3. Wide variations were observed in prices of eggs in Delhi market during the entire period of study. The lowest price of eggs was observed during the month of April 2010 i.e., Rs.194.10 and the highest price was observed during the month of December 2021 i.e.,Rs. 540.32. The average price per 100 eggs in Delhi for the entire period considered under study is Rs.341.17.

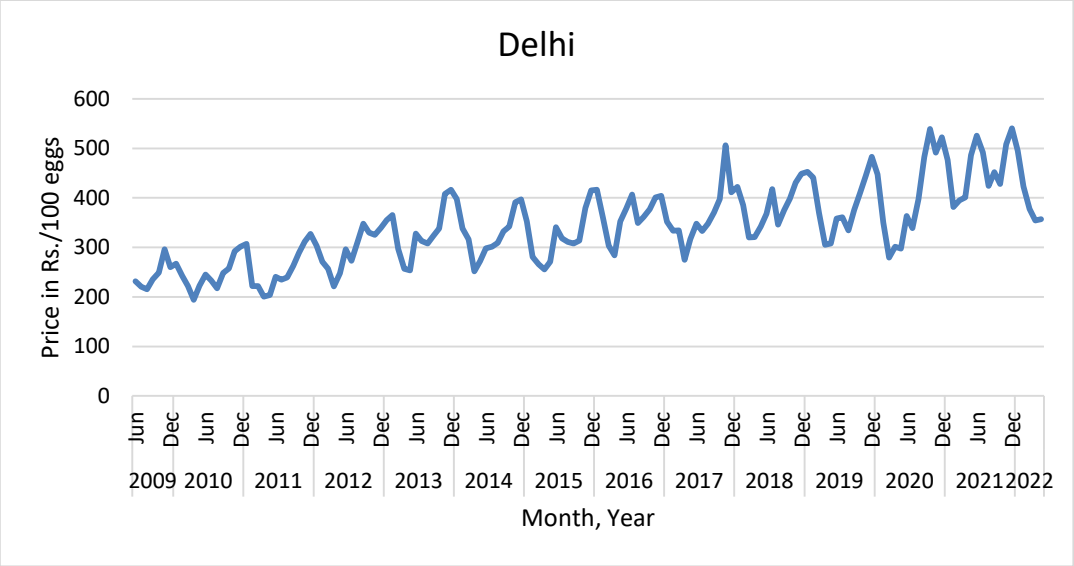

Fig.3 Prices of eggs in Delhi

<u>3.1.4 Price movement of eggs in Mumbai:</u> The variations in prices of eggs in Mumbai are portrayed in Fig.2. Wide fluctuations were observed in egg prices in Mumbai ranging from lowest Rs.217.23 in April 2011 to highest Rs.559.10 in June,2021. Average price per 100 eggs in Mumbai during the study period is Rs.366.06.

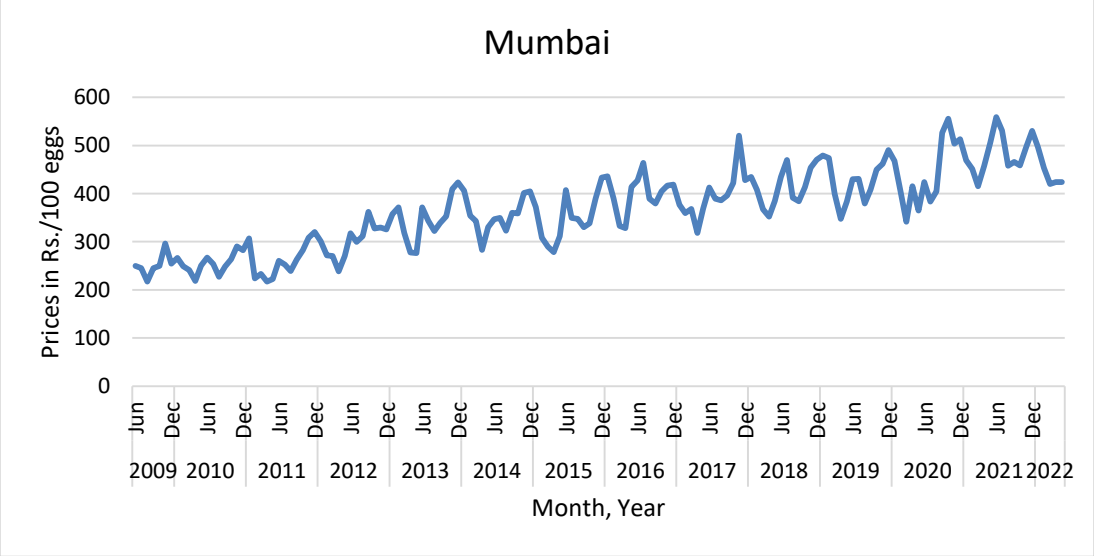

Fig.4 Prices of eggs in Mumbai

3.2 Trend analysis- The prices of eggs in all the selected markets showed a highly significant increasing trend. All the markets are significant at 1% probability level. The annual increase in egg prices was highest in Mumbai market (Rs.1.57/100 eggs) and lowest in Delhi market (Rs.1.35/100 eggs). The adjusted R square indicated the contribution of time to change in prices to the tune of 58 to 77 per cent

Table 1: Trends in prices of eggs in selected markets

Market	Equation	Adj-R Square	p-value
Bengaluru	234.13+1.4572*t	0.74	6.99E-47**
Chennai	243.46+1.4878*t	0.77	1.94E-51**
Delhi	235.47+1.3465*t	0.58	1.47E-31**
Mumbai	242.65+1.5720*t	0.74	1.76E-47**

Note:** represents significance at 1 per cent probability level

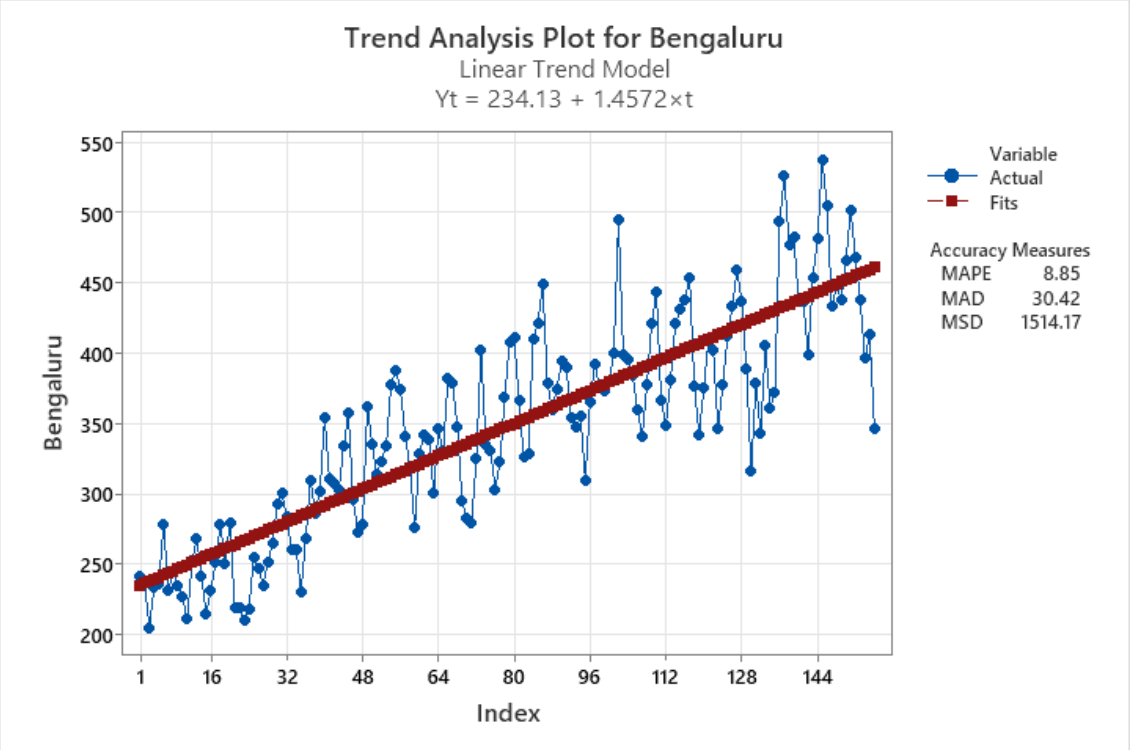

Fig.5 Trend analysis plot for Bengaluru

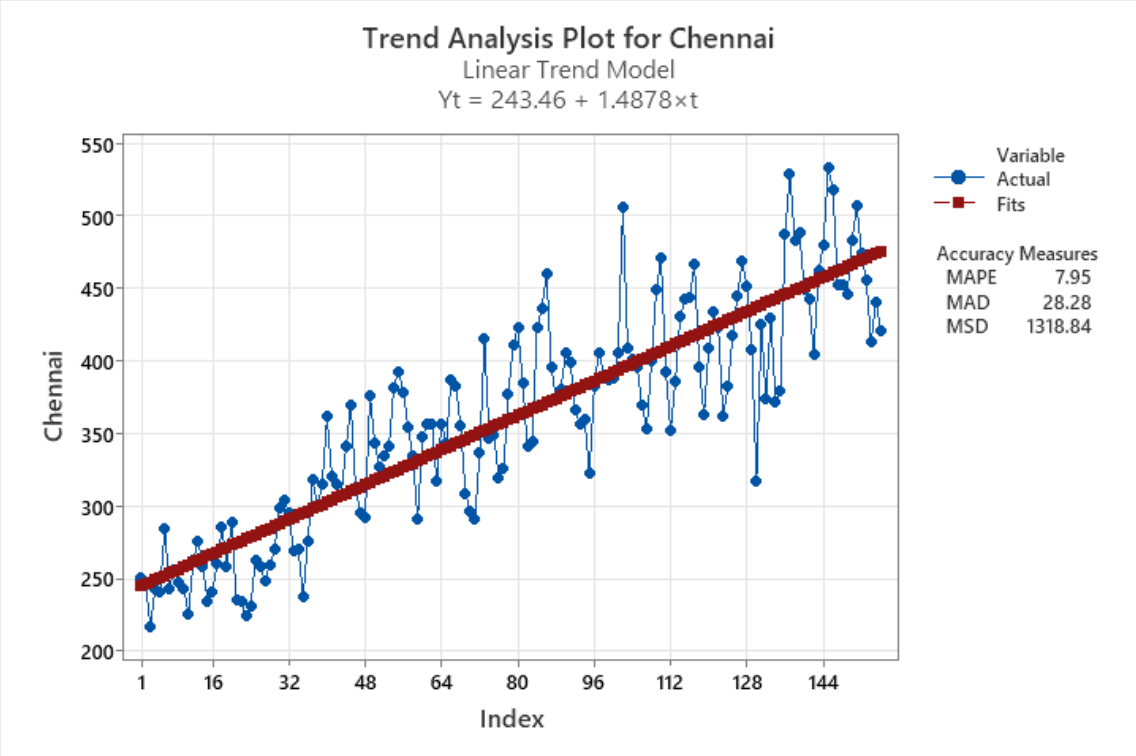

Fig.6 Trend analysis plot for Chennai

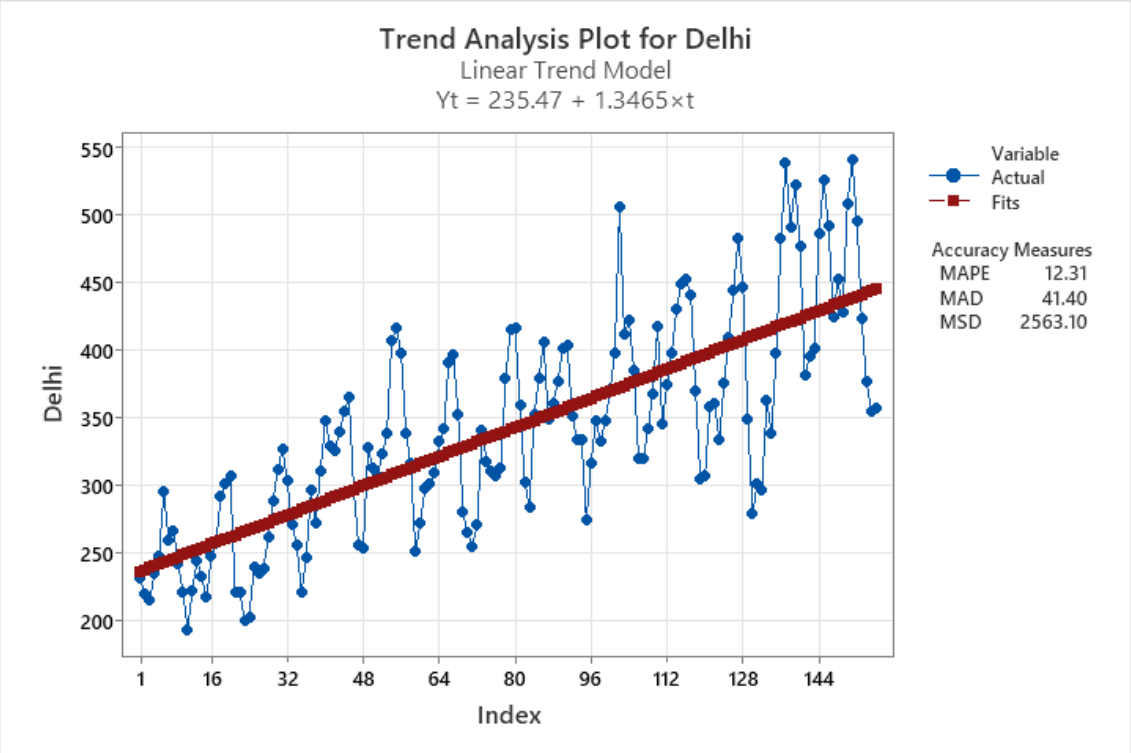

Fig.7 Trend analysis plot for Delhi

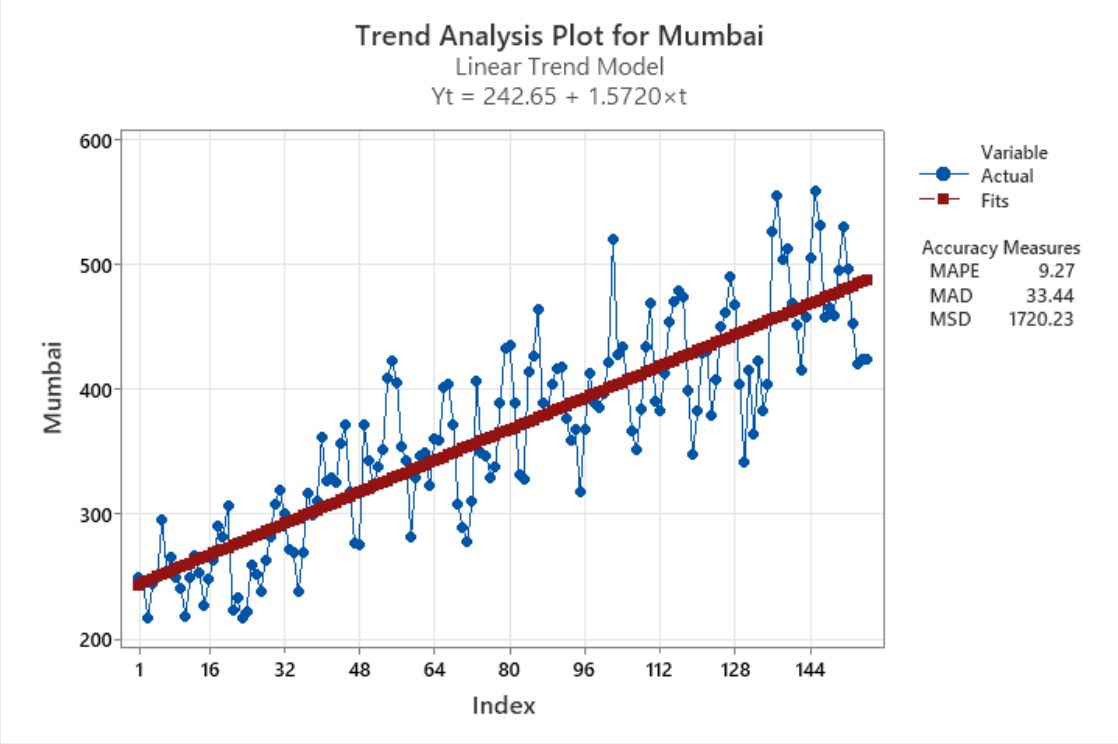

Fig.8 Trend analysis plot for Mumbai

3.3 Seasonal variations of prices of eggs- Seasonal indices of eggs are calculated for the selected markets and the results are presented in Table 2. In Bengaluru and Chennai markets, highest seasonal index (110.04 and 108.53) was observed in June and lowest seasonal index was observed in November (86.58 and 87.92). In Delhi and Mumbai markets, highest seasonal index of 119.76 and 112.12 respectively was found in the month of July and lowest seasonal index of 80.49 and 84.10 respectively was found in the month of November. Seasonal indices of all the markets are presented in graphs (Fig-9 to 12). The prices of eggs decrease both in April and November months. During April the prices of eggs decrease due to short shelf life of eggs because of summer. During November the prices of eggs decrease due to increase in arrivals of eggs. Highest price in June and July months due to increase in consumption of eggs during these months.

Table 2. Seasonal indices of egg prices in selected markets

Month	Seasonal Indices			
	Bengaluru	Chennai	Delhi	Mumbai
January	108.33	107.81	99.26	106.15
February	100.32	100.59	94.38	99.70
March	93.88	95.53	94.45	93.45
April	97.16	96.47	100.94	98.05
May	101.35	100.98	106.05	103.70
June	110.04	108.53	116.46	110.39
July	108.19	107.01	119.76	112.12

August	106.30	105.55	112.53	109.00
September	97.96	97.62	99.58	98.17
October	92.41	93.10	90.37	92.96
November	86.58	87.92	80.49	84.10
December	97.49	98.89	85.73	92.22

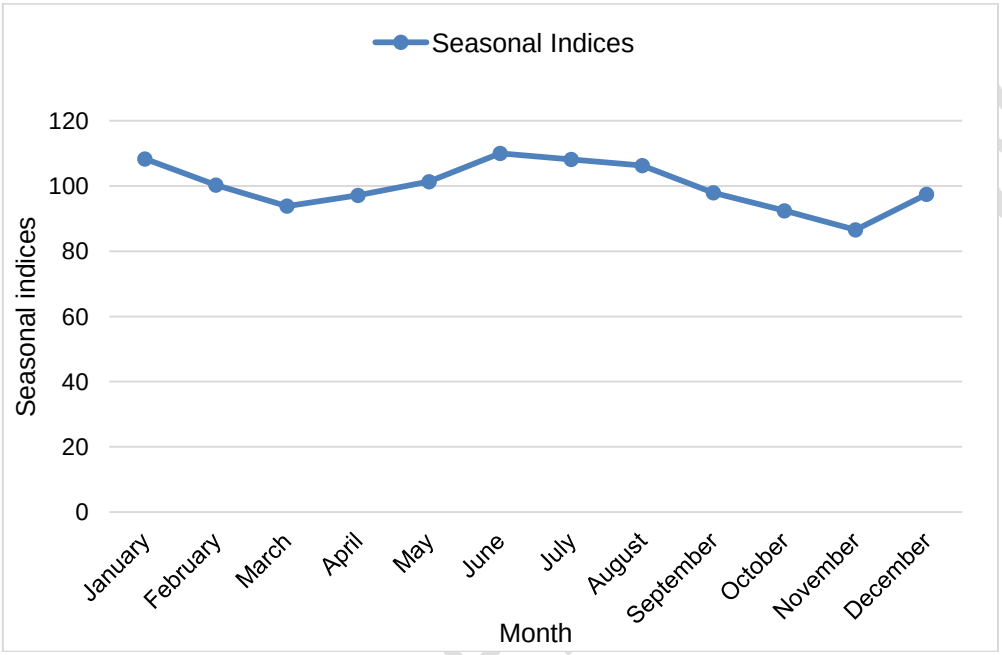

Fig-9: Seasonal indices of prices of eggs in Bengaluru market

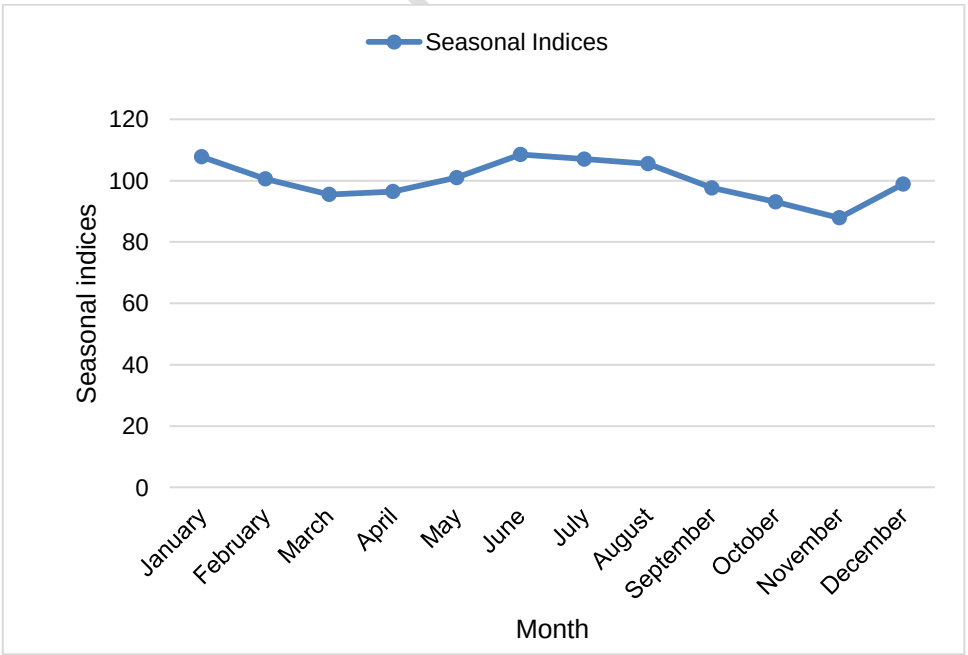

Fig-10: Seasonal indices of prices of eggs in Chennai market

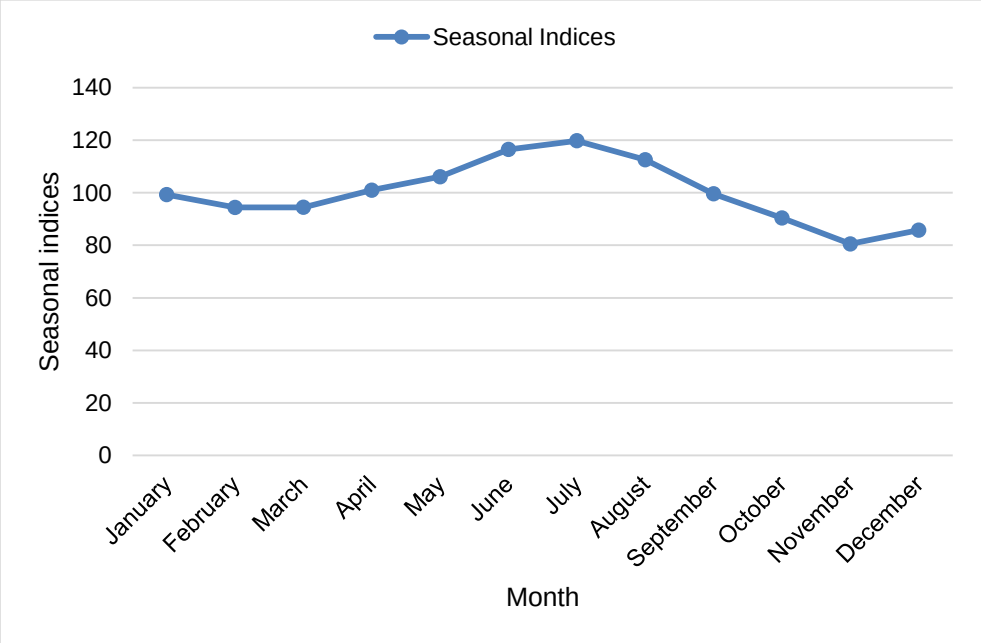

Fig-11: Seasonal indices of prices of eggs in Delhi market

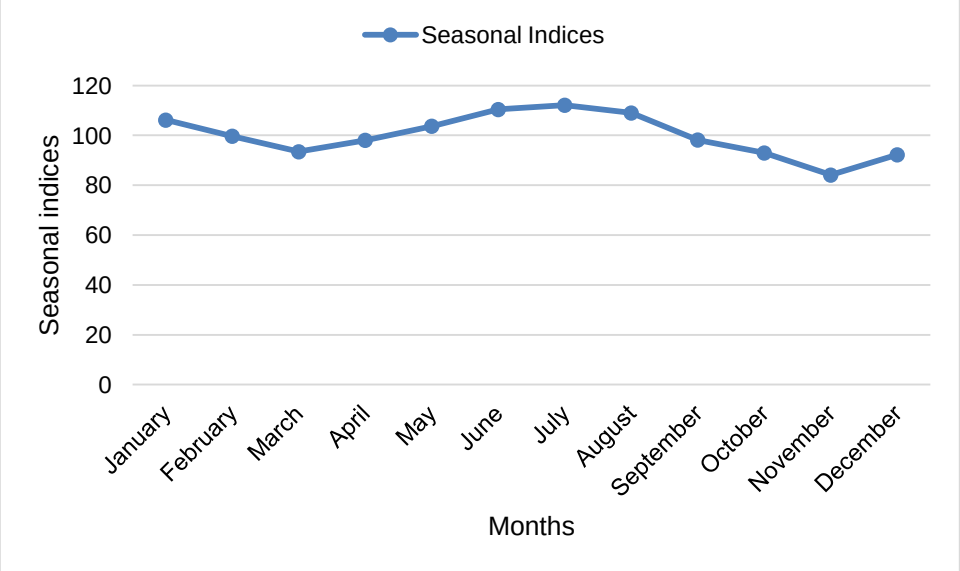

Fig-12: Seasonal indices of prices of eggs in Mumbai market

3.4 Cyclical variations in prices of eggs- The cyclical variations in prices of eggs are graphically presented from Fig.13 to 16. No price cycles were observed for eggs in all the selected markets of India.

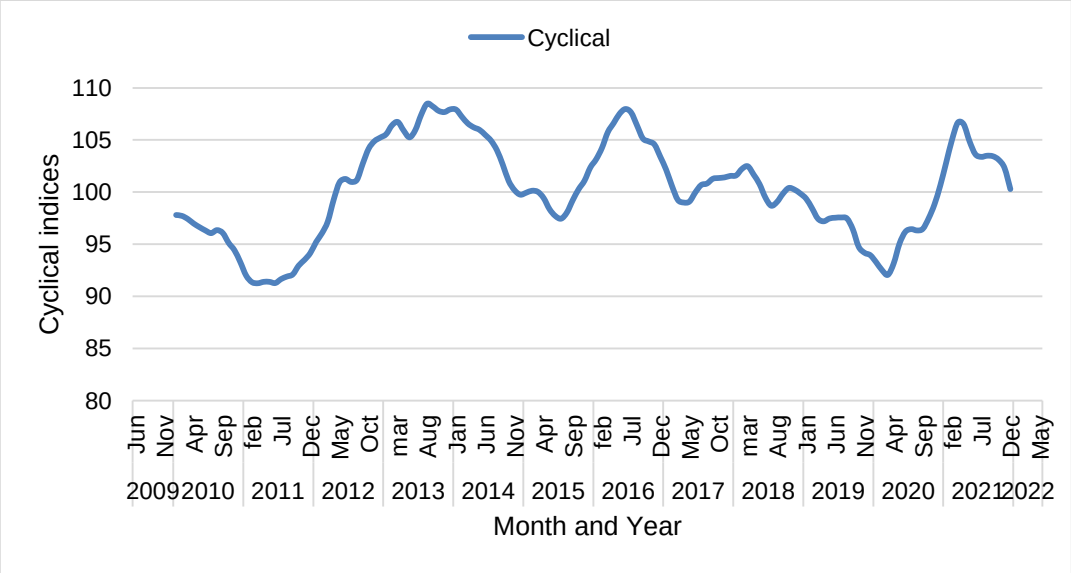

Fig-13:Cyclical indices of prices of eggs in Bengaluru market

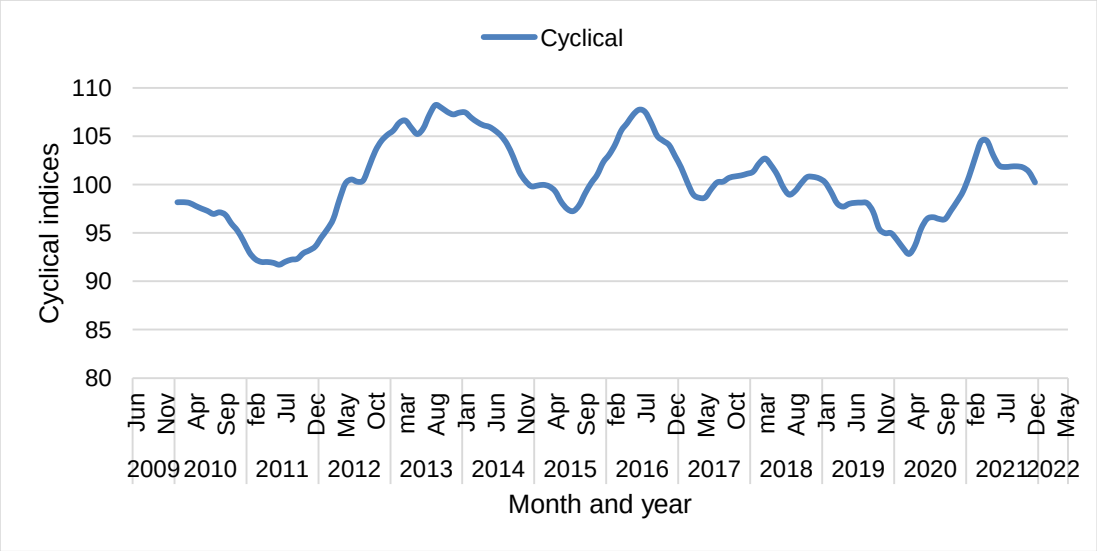

Fig-14: Cyclical indices of prices of eggs in Chennai market

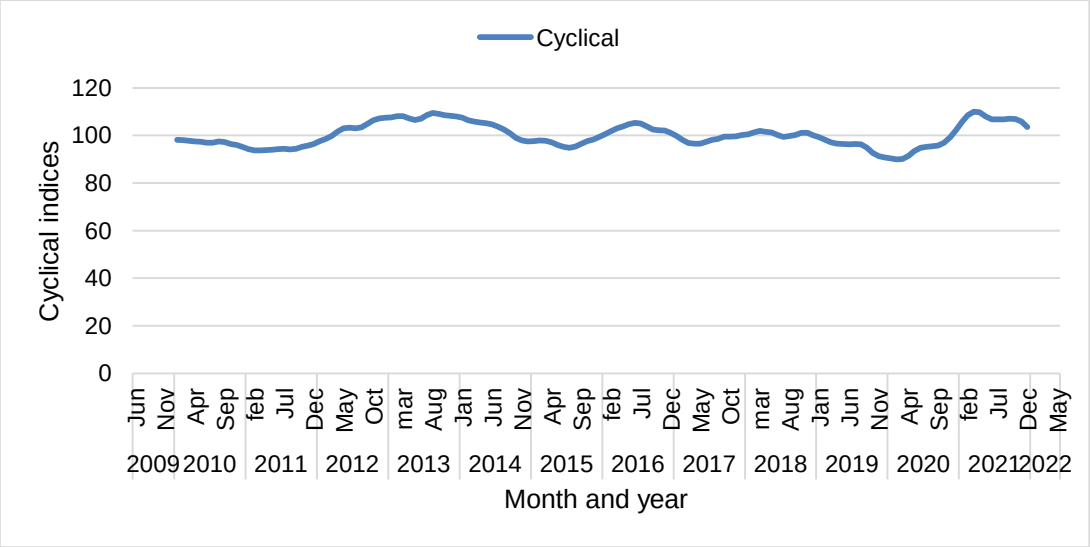

Fig-15: Cyclical indices of prices of eggs in Delhi market

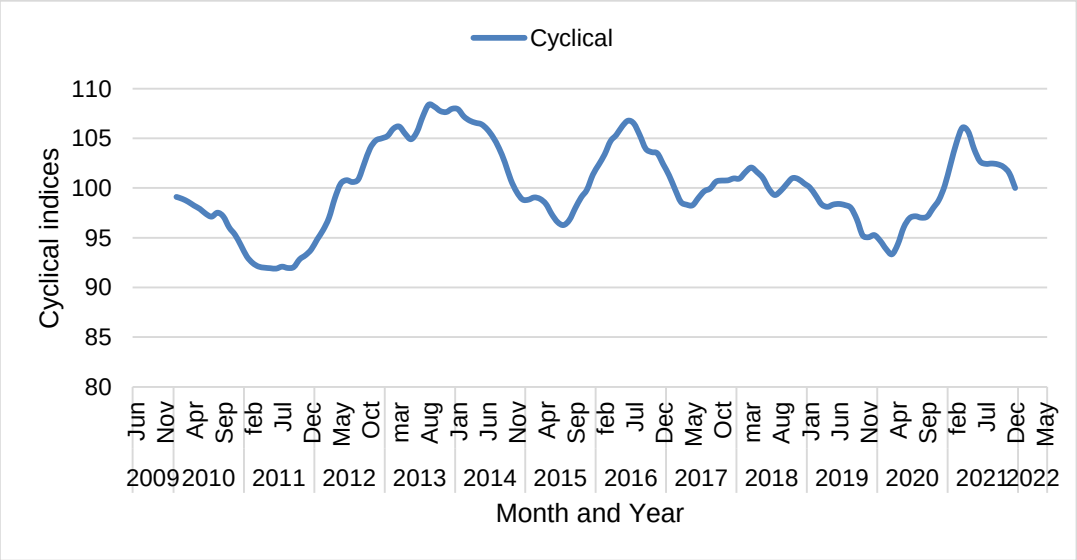

Fig-16: Cyclical indices of prices of eggs in Mumbai market

3.5 Irregular variations in prices of eggs- Irregular variations for all the selected markets are depicted in the form of graphs(Fig-17 to 20). Irregular variations in all the selected markets did not show any definite periodicity in their occurrence.

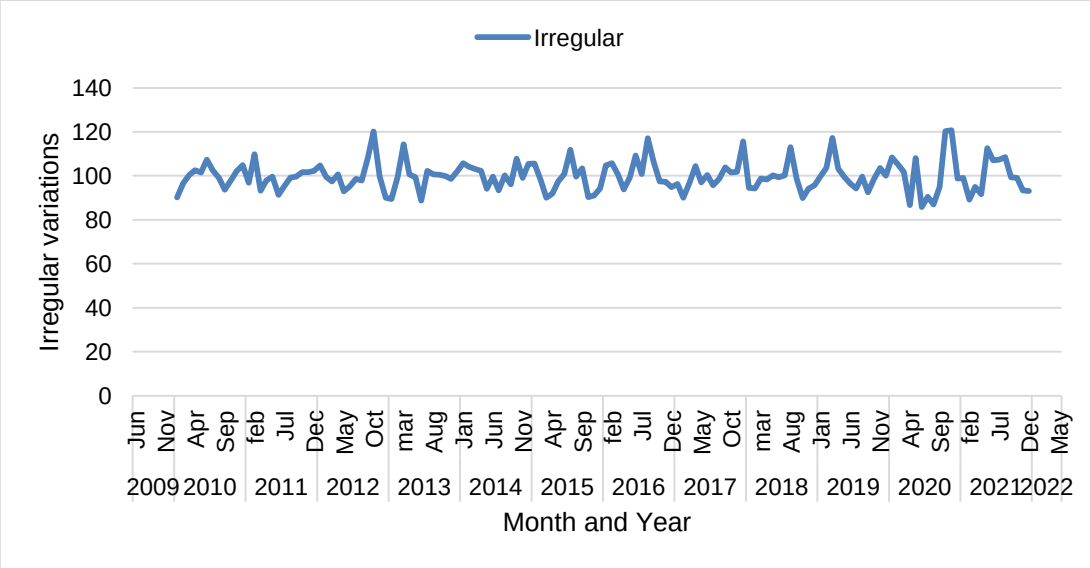

Fig-17: Irregular variations in prices of eggs in Bengaluru market

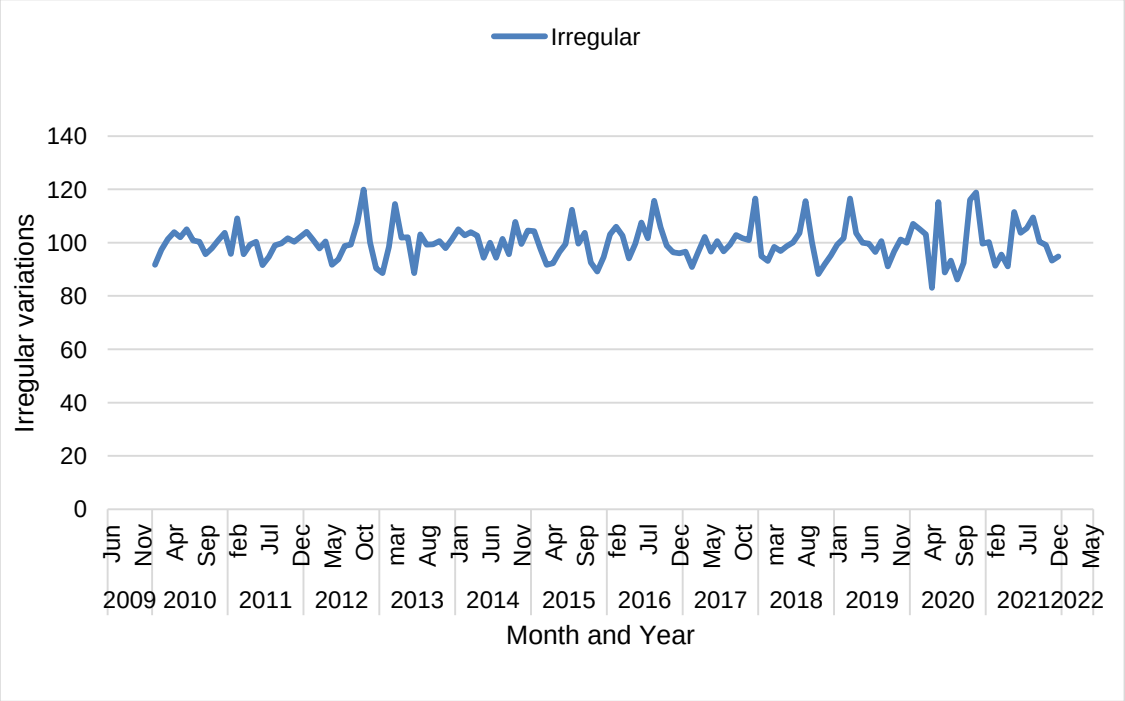

Fig-18: Irregular variations in prices of eggs in Chennai market

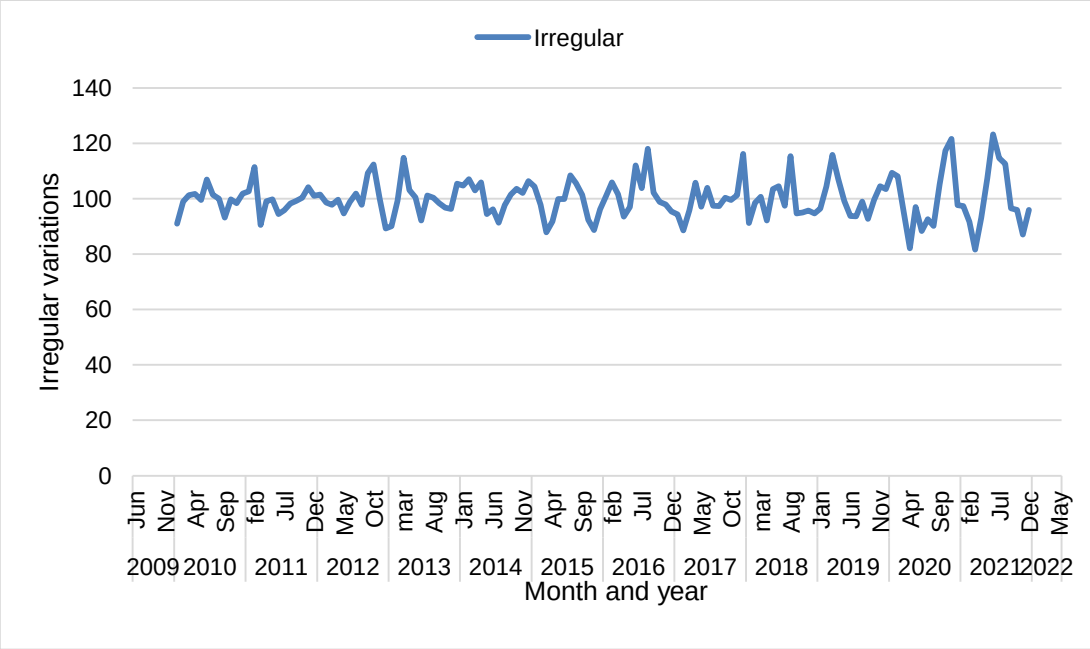

Fig-19: Irregular variations in prices of eggs in Delhi market

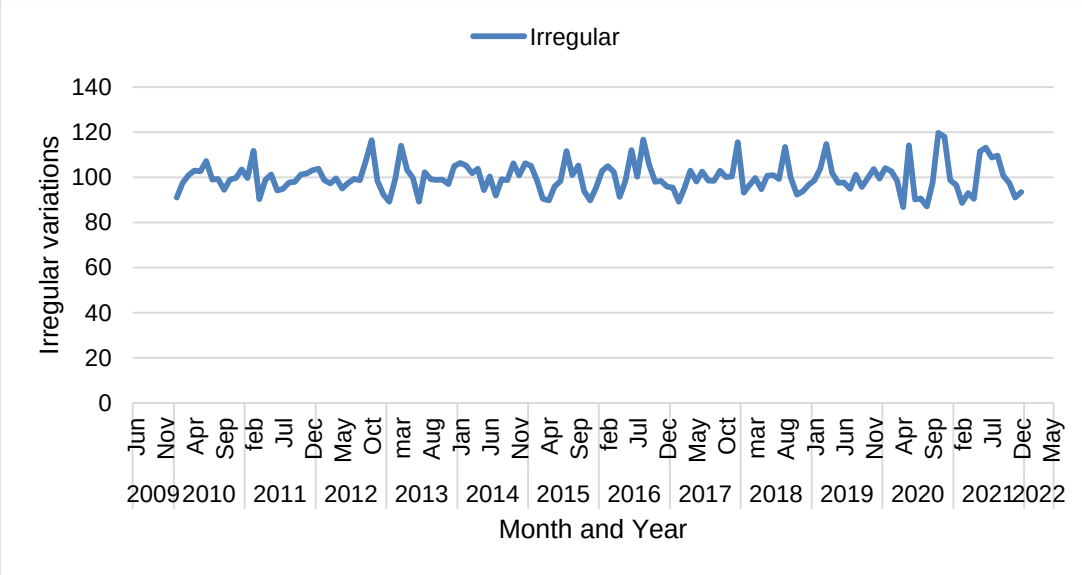

Fig-20: Irregular variations in prices of eggs in Mumbai market

4. CONCLUSION

The research findings concluded that, there is uniformity in prices of eggs across various markets in India due to organized egg marketing. Though the egg prices show wide fluctuations in the study period, they also show a significant increasing trend. During April the prices of eggs decrease due to short shelf life of eggs because of summer. During November the prices of eggs decrease due to increase in arrivals of eggs. Highest price in June and July months due to increase in

consumption of eggs during these months. Price cycles are not observed and irregular variations are conspiquous.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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