AMIC – INFOSERIES – 2
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Cardamom Update

INTRODUCTION

Small Cardamom (*Elettaria cardamomum*), rightly described as the "Queen of Spices", enjoys an enviable position in the international trade of spices. It is the world's third-most-expensive spice after saffron and vanilla. Cardamom is used as a spice in many culinary preparations and as a confectionery. It also finds use in quite a number of medicinal formulations. The oil contained in the seeds and pods are used in perfumes and as a stimulant.

Guatemala, India, Sri Lanka, Tanzania, El Salvador, Vietnam, Laos, Cambodia and Papua New Guinea are the major cardamom growing countries in the world. The world production of cardamom is around 36,000 tonnes per annum. Guatemala leads the global production, with an annual production of around 23,000 tonnes, followed by India and Tanzania. The West Asian countries, Pakistan, European community, USA and Japan form the major consuming countries. Among the West Asian countries, UAE and Saudi Arabia accounts for nearly 60 per cent of the consumption, followed by Denmark, Finland, Norway, Iceland accounting for 16 per cent and Japan and USA, each accounting for 2.5 per cent each.

Most variables in nature fluctuate in time. Price is no exception. Though price fluctuations can be considered as to be a random and unpredictable phenomenon, it is possible to net out different behavioral patterns from any time series with the development of

the time series econometrics. It is against this background that the secular trend, seasonal, cyclical and irregular movements in the price of cardamom is being discussed.

METHODOLOGY

Domestic price at Vandanmettu market, which is considered to be the most appropriate reference price for cardamom in India, was considered for the analysis. Month wise modal price data were collected from the Spices Board, Kochi, pertaining to the period from August 1996 to October 2009, covering a time span of 13 years.

A multiplicative model of the following form was used to study the components of the time series:

$$Y(P) = T * C * S * I$$

where, Y (P) = Monthly average price of Cardamom

T = Secular trend

C = Cyclical movement

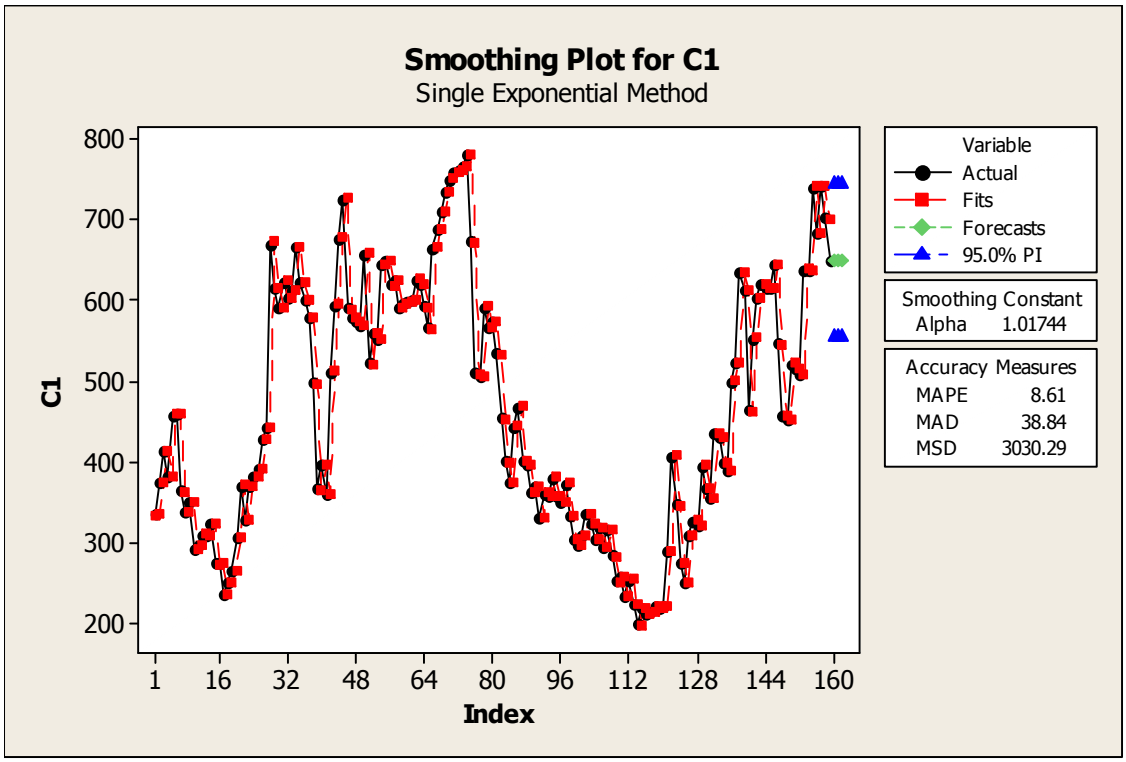
S = Seasonal index, and

I = Irregular movement

Trend Analysis of Cardamom Prices

The trend lines fitted using linear, quadratic, cubic, compound, growth, logarithmic, sigmoid, exponential, inverse, power and logistic functional forms did not provide a satisfactory fit in terms of R^2 values and standard errors. Hence, trend lines were fitted with single exponential smoothing as plotted in the Fig.1. This fit had a mean absolute percentage error (MAPE) value of 8.61 per cent.

Fig. 1 Single Exponential Smoothing for price of cardamom



As is evident from the above figure, cardamom prices were subjected to considerable fluctuations during the period from 1996 August to 2003 October, depicting a mixed trend. However, the period from July 2007 is characterized by a growth phase in cardamom prices. A record price of Rs.739/Kg was reached during June 2009, after a long gap. This price was comparable with the price level that prevailed for a short while during the period from April 2002 to September 2002.

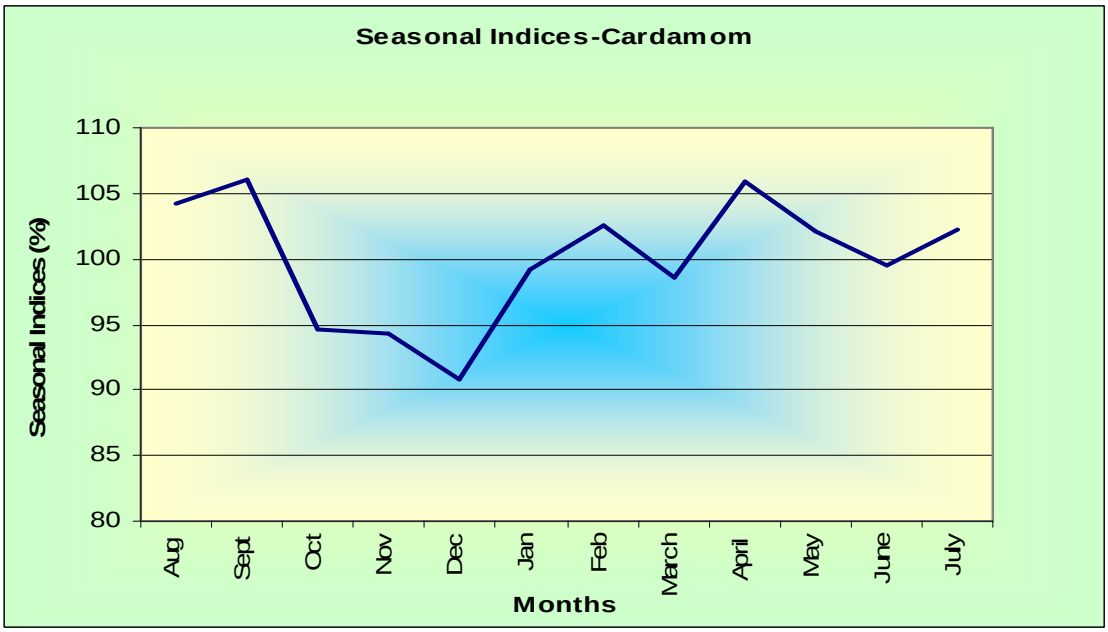
Seasonal Effect

The seasonal variations in the price of cardamom can be gauged from Table1 and Fig.2. It is evident that cardamom price exhibited considerable seasonal effect.

Table 1: Seasonal Index of Cardamom

Months	Seasonal Index
August	103.91
September	105.84
October	94.94
November	94.60
December	90.25
January	99.39
February	101.52
March	98.76
April	106.09
May	102.10
June	100.95
July	101.66

Fig.2. Seasonality in Cardamom prices

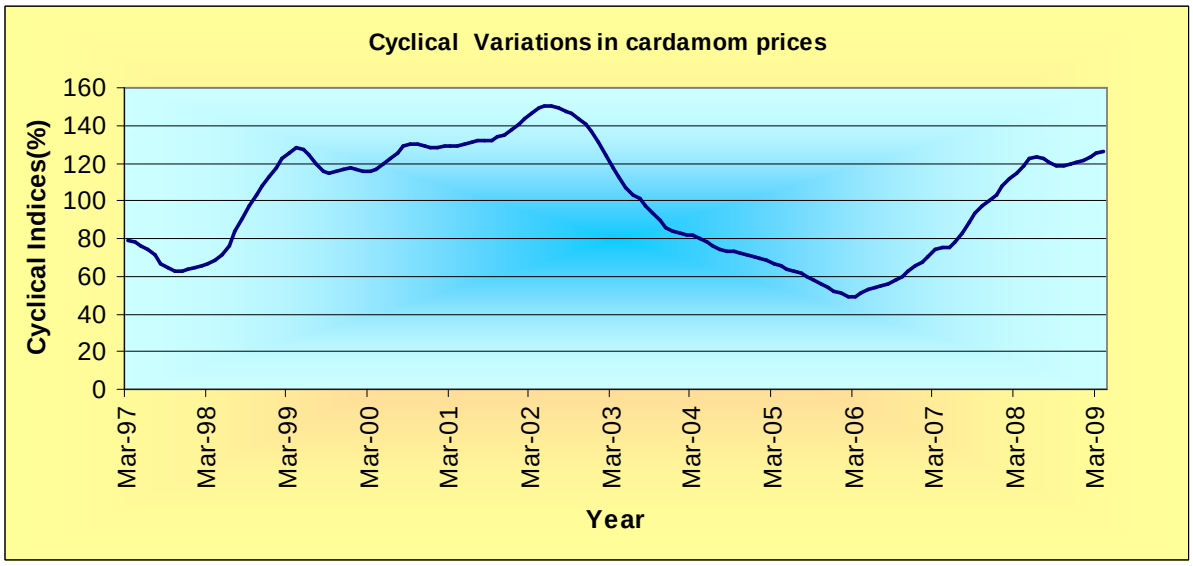


April and September months were characterized by peak prices where as December represented the trough month. By and large, the period from October to March was marked by seasonal lean period as far as the prices were concerned, while the period from April to September was marked by seasonal buoyant phase. The harvest period of cardamom in Kerala synchronizes from October to February, with the peak harvest taking place in October November and December months. This period is typically characterized by a depressed phase for the prices, as a result of increased market arrivals signaling the market to respond accordingly.

Cyclical Effect

Price cycles represent deviations in price levels from the average trend due to business sequences of boom and recession appear in the economy. The analysis reveals that cardamom prices from the period from March 1998 to October 2002, represents a boom phase lasting for about five years, while the period from November 2002 to March 2006 represents a recession phase, lasting for about three and half years (Fig.3). It is evident that price cycles do appear in cardamom prices. The length of the total cycle is estimated to about eight years. The question as regards to whether this cycle was preceded by or succeeded by other cycles need analysis of longer time horizon.

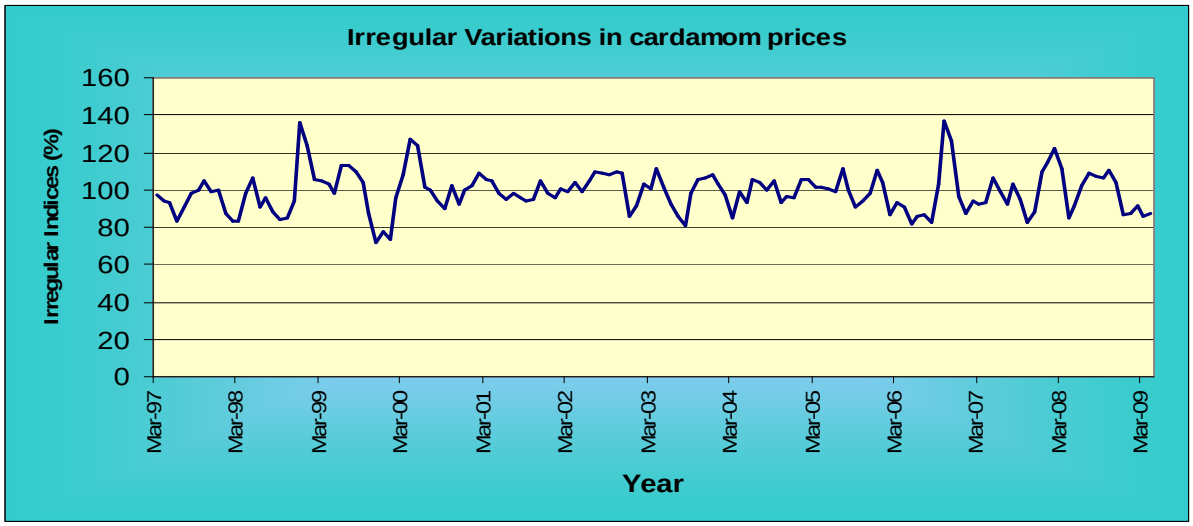
Fig. 3. Cyclical fluctuations in Cardamom prices



Random Effect

The irregular components are the “residues” left in the time series after the trend and calendar effects have been removed. Hence, it is referred to as the “residual effect’ also. The irregular variations in cardamom price are depicted in Fig 4. It can be noted that cardamom prices were subjected to high irregular variations during the period under consideration. These are due to random effects such as supply shocks on account of climatic deviations, or market shocks on account of demand shocks or high speculative factors. In internationally traded commodities, where diverse production, consumption and trade interests come into picture, such push and pulls are common and expected.

Fig.4. Irregular variations in Cardamom prices



CONCLUDING REMARKS

Knowledge about the components of commodity price will be helpful in understanding the intricacies of market behaviour. The time series analysis conducted on cardamom prices showed that it contained the trend effects, seasonal effects, cyclical effects and irregular or random effects. This information can be of immense value to farmers, traders as well as to exporters in guiding future selling, stocking/outsourcing and contract phasing decisions to their advantage.

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