



Anfis Price Interpreter System

R.Brintha*

Research Scholar

Department of Computer Science
Pondicherry University, Karaikal, India**S.Bhuvaneswari**

Head

Department of Computer Science
Pondicherry University, Karaikal, India

Abstract— Online Commodity Trading is a chaotic system for forecasting, since it has no axiom to predict the future price of commodity. The price volatility in the trading is inconsistent which makes the predicting methods such as technical analysis, fundamental analysis, time series analysis and statistical analysis etc. to be uncertain for predicting the price. ANFIS (Adaptive Neuro- Fuzzy Inference System), a universal estimator, combines both neural networks and fuzzy logic principles to invent an inference system that have the capability of learning to approximate the nonlinear functions. The resultant fuzzy inference system gets adapted to the learnt environment and it reflects according to the situations in the future testing. This is a best method to establish the unknown and hidden pattern in the data and hence it effectively interprets the price hike in OCT(online commodity trading). ANFIS PRICE INTERPRETOR SYSTEM incorporate these features for predicting the commodity price pattern using ANFIS, there are two modules, one is training session done by backpropogation algorithm and other is predicting price pattern based on the inference rules(if-then rules) formed by the previously trained data. In this paper, APIS system predicts the price of a commodity-CHANNA, which plays a very important role in human diet in India. It is widely appreciated as health food that offers the most practical means of eradicating protein malnutrition among vegetarian children and nursing mothers. By predicting the price of Channa in OCT and by further prediction of future prices after it has been banned in Online commodity trading, it proves that there is no major impact of price hike and the price inflation. This system also suggests not to ban the product; instead some regulatory measures to be taken.

Keywords— Online commodity Trading, ANFIS, APIS, Fuzzy Logic, Neural Network, normalized

I. INTRODUCTION

Commodity is a marketable item that can be bought or sold. Online Commodity Trading(OCT) is a platform for the trading of a commodity without any visual inspection. In OCT, the future price is traded instead of the physical product. The history of futures trading in commodities in India dates back to the later part of 19th century when the first commodity exchange, viz...The Bombay Cotton Trade Association Ltd was set up for organizing futures trading. The early 20th century saw the mushrooming of a number of commodity Exchanges. The principal commodity markets functioning in pre-independence era were the cotton markets of Bombay, Karachi, Ahmadabad and Indore, the wheat markets of Bombay, Hapur, Karachi, Lyallpur, Amritsar, Okra and Calcutta; the groundnut markets of Madras and Bombay; the linseed markets of Bombay and Calcutta; Jute and Hessian markets of Calcutta; Bullion markets of Bombay, Calcutta, Delhi and Amritsar and sugar markets of Bombay, Calcutta, Kanpur and Muzaffarnagar. There were no uniform guidelines or regulations. These were essentially outcomes of needs of particular trade communities and were based on mutual trust and faith. They were regulated by social control of close-knit groups and whenever such control failed, there would be a crisis.

II. ANFIS

MATLAB, the language of technical computing, is a numerical computing environment and fourth-generation programming language. Developed by MathWorks, ANFIS (Adaptive Neuro- Fuzzy Inference System), a universal estimator is a built-in tool of MATLAB combines both neural networks and fuzzy logic principles to invent an inference system that have the capability of learning to approximate the nonlinear functions. Fuzzy logic is a logical system, which is an extension of multivalued logic.

The fuzzy inference system that we have considered is a model that maps

- input characteristics to input membership functions,
- input membership function to rules,
- rules to a set of output characteristics,
- output characteristics to output membership functions, and
- the output membership function to a single-valued output, or
- a decision associated with the output.

III. DESCRIPTION OF THE STUDY AREA

A. Selection of the Commodity Exchanges & Commodity

The present study was conducted with respect to National Commodity and Derivatives Exchange Ltd (NCDEX) Mumbai which started trading in November 2003. This exchange are playing very important role in the trading activities

in India. As such the national commodity exchanges have been purposively selected for the present study. For the present study, major agricultural commodity, channa, currently traded in the commodity exchanges were selected. This commodity had been selected based on the volume of trade in its group.

Recommended font sizes are shown in Table 1.

B. National Commodities and Derivatives Exchange (NCDEX)

National Commodity & Derivatives Exchange Limited (NCDEX) is a professionally managed on-line multi commodity exchange promoted by ICICI Bank Limited, Life Insurance Corporation of India (LIC), National Bank for Agriculture and Rural Development (NABARD) and National Stock Exchange of India Limited (NSE). Canara Bank, Credit Rating Information Services of India Limited (CRISIL), Goldman Sachs, Indian Farmers Fertilizer Cooperative Limited (IFFCO) and Punjab National Bank (PNB) by subscribing to the equity shares have joined the initial promoters as shareholders of the Exchange. NCDEX is the only commodity exchange in the country promoted by national level institutions.

C. Channa

Channa is widely appreciated as health food. It is a protein-rich supplement to all cereal based diet, especially for vegetarians. Pulses proteins are rich in lysine and have low sulphur containing amino acids. It offers the most practical means of eradicating protein malnutrition among vegetarian children and nursing mothers. Channa has a very important role in human diet in our country.

Market influencing factors

- Rainfall level and level of moisture in the soil
- Crop yield & acreage
- Problems in information flow
- Supply and demand
- Prices of the other competitive pulses produced
- Black-marketing and hoarding

IV. IMPLEMENTATION

For the purpose of accomplishing the objectives of the study, data were analysed using ANFIS Tool along with its embedded techniques.

ANFIS, a universal estimator, paves the way to predict the future price of a commodity. ANFIS system accepts the essential input data (excluding the noisy data) to construct the membership functions. Those functions are further analysed by the inference rules that results the output membership functions. These functions are approximated to the linear value by validating the most accurate output data. The APIS is constructed to predict the price pattern of a commodity. A higher level of prediction is done with a large sample size of data is positively correlated with the demand for any type of commodity. The normalized data may increase the Fuzzy Inference System’s ability that reflects in the performance of the APIS positively. Thereby creating the APIS, the price pattern of a commodity is found near accurately. OCT price prediction depends on the factors such as **supply, demand, crop acreage, domestic production, carry forward stock, import and export, close price, spot price, volume ,open interest.**

TABLE I
FACTORS SELECTED

Sl No.	Factor	Type
1	Date	Independent
2	Spot price	Independent
3	Volume	Independent
4	Close price	Dependent

A. Input selection

Data are collected based on daily futures price, spot prices, and volume of trade on exchanges were collected from the official web site of the National Level Commodity Exchanges in India for the period 2007.

The data for the selected factors are converted into “continuous data” by removing the noise for time series prediction. Thus by making the data “NORMALISED”, ANFIS system works accurately for predicting the future price. The data of the selected factors are normalized by using the formula,

$$p = \frac{x - y}{y} * 100$$

Where,

P=percentage of price fluctuation

X=today’s price

Y=yesterday’s price

The data is converted into continuous data by the above defined formula and fed into the ANFIS PRICE INTERPRETOR SYSTEM.

B. Train Adaptive Neuro-Fuzzy Inference Systems(GUI)

The ANFIS PRICE INTERPRETOR SYSTEM is created, trained, tested and calculated the error using ANFIS, a tool of MATLAB. APIS is built and by using the following tasks.

1. Loading Data
2. Initializing and Generating FIS
3. Viewing FIS Structure
4. ANFIS Training
5. Testing Data Against the Trained FIS

The large sample size training data were collected form NCDEX-Channa commodity. Channa, an agricultural commodity has a high positive turn around every year. But due to the steep increase of the price pattern in OCT, it has been demanded to ban further. Therefore it is banned in 2007 which results in the stagnation of the channa in the market and it strongly affects the price risk of the farmers. Then after the complete study and the great bewilderment in the supply chain management it comes into existence after a year. So the product is interpreted by the APIS and finds the impact of Online Commodity Trading in the price inflation, by predicting the price after the product has been banned.

The sample data is loaded and trained to construct the fuzzy inference system by generating the inference rules. The constructed system reflects what they have learnt, in the future prediction. If there is an utter confusion in the working, it adjusts the inference rules by using backpropogation algorithm which produce the result that nears to the accurate value with minimum Sum Squared Error rate.

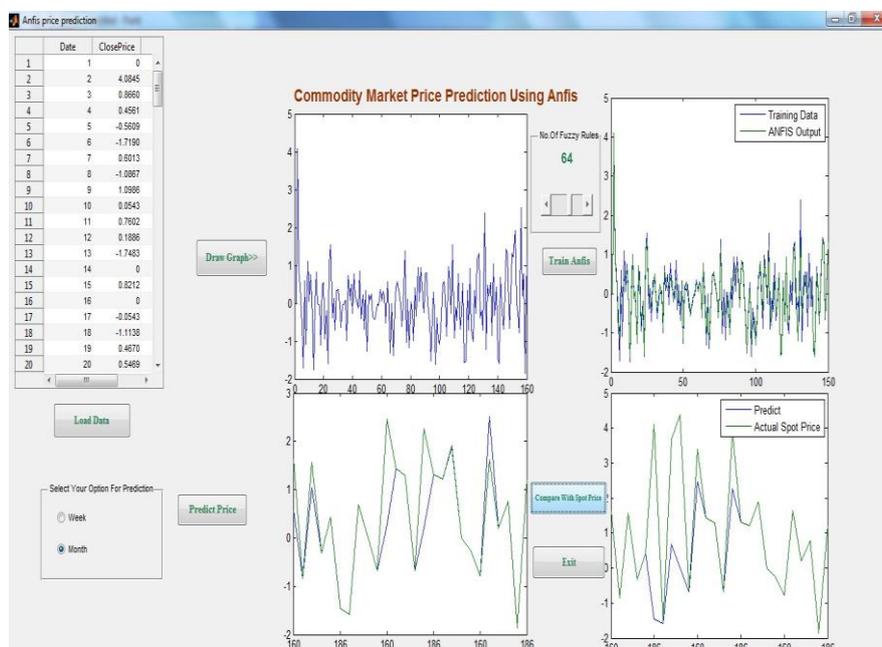


Fig. 1 Price Interpretation of Channa in NCDEX

C. Observation

1. The Sum Squared Error value is minimized when the number of inputs is 4. When there is an increase/decrease in the number of inputs, the Sum Squared Error value is increased.
2. The prediction of price pattern becomes complex when there is a spasmodic variation in the training data.
3. The price pattern may get vary sporadically without any ulterior motive.

V. CONCLUSION

The proposed ANFIS PRICE INTERPRETOR SYSTEM is a model for predicting the future price pattern of commodities in NCDEX Exchange using past historic datasets. The functions of a class and Fuzzy Inference System equivalent ANFIS, universal functions approximation, which can approximate any continuous function to any desire accuracy APIS, adaptive network is trained using back-propagation algorithm search space series, improving the convergence rate. Performance metrics of ANFIS calculates the accuracy and error rate of APIS model. The potential benefit of these predictions lies in assisting producers in making better-informed decisions and managing price risk. Suspension of trading is a not a solution and may actually harm the process of market development. Rather, an efficient surveillance system that studies the price pattern of the period and concludes the further price variation, which in turn helps to minimize probability of price distortions. APIS compares the spot & future price of the commodity after it had been banned. The result proves that there is no major impact in price inflation after the product being banned. It almost goes off with the future price and the spot price. This result suggests taking some regulatory measures instead of banning.

REFERENCES

- [1]. EbrahimAbbasi, and Amir Abouec,” Stock Price Forecast by Using Neuro-Fuzzy Inference System”, International Journal of Human and Social Sciences 415 2009.
- [2]. MelekAcarBoyacioglua, DeryaAvci, “An Adaptive Network-Based Fuzzy Inference System (ANFIS) for the prediction of stock market return The case of the Istanbul Stock Exchange” Expert Systems with Applications 37 (2010) 7908–7912.
- [3]. MeysamAlizadeh, Mohsen Gharakhani, ElnazFotoohi and Roy Rada, “Design and analysis of experiments in ANFIS modeling for stock price prediction”, International Journal of Industrial Engineering Computations 2 (2011) 409–418.
- [4]. RiaArafiyah and Alimuddin, “Prediction of Price of Local Fruits in Jakarta With ANFIS”, AFITA 2010 International Conference, The Quality Information for Competitive Agricultural Based Production System and Commerce.
- [5]. www.ncdex.com
- [6]. www.mathworks.com