PROJECT REPORT ON
(16MBAPR407)

A STUDY ON VOLATILITY OF SELECTED INDIAN AGRICULTURAL COMMODITY PRICES IN INDIA

BY

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1AZ16MBA84

Submitted to

VISVESVARAYA TECHNOLOGICAL UNIVERSITY,
BELGAUM

In partial fulfilment of the requirements for the award of the degree of
MASTER OF BUSINESS ADMINISTRATION
Under the guidance of

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May 2018

PATTERN EFFECTS
SIMPLYFYING AI

Certificate of Experience

This is to certify that **Mr. Yugantar Mishra** has done internship at Pattern Effects Labs Private Limited as "***Finance Analyst-Intern***" from January 8th 2018 to April 30th 2018 on under the guidance of Mr. Shiv Shankar Das.

We have found him to be a self-starter who is motivated, duty bound and Hard-working.

He worked sincerely on his assignments and his performance was **Par Excellence.**

We wish him best of luck for his future.

For Pattern Effects Labs

PATTERN EFFECTS LABS PVT. LTD. BANGALORE

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(Affiliated to Visvesvaraya Technological University, Belagavi, Approved by AICTE, New Delhi and Accredited by NBA and NAAC)

Date: 19/05/2018

CERTIFICATE

This is to certify that **Mr. Yugantar Mishra** bearing USN **1AZ16MBA84** is a bonafide student of Master of Business Administration course of the Institute 2016-18 batch, affiliated to Visvesvaraya Technological University, Belagavi. Project report on "**A Study on Volatility of Selected Indian Agricultural Commodity Prices in India" at Pattern Effects Labs Pvt. Ltd., Bangalore** is prepared by him under the guidance of **Prof. Swarupa Ranjan Panigrahi** in partial fulfillment of the requirements for the award of the degree of Master of Business Administration, Visvesvaraya Technological University, Belagavi, Karnataka.

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PRINCIPAL
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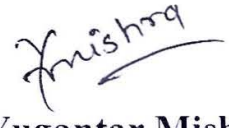
Soldevanahalli Bangalore-560 107

DECLARATION

I, Yugantar Mishra, bearing USN 1AZ16MBA84 hereby declare that the Internship report entitled "A STUDY ON VOLATILITY OF SELECTED AGRICULTURAL COMMODITY PRICES IN INDIA" prepared by me under the guidance of professor Mr. Swarupa Ranjan Panigrahi, Professor of MBA Department, Acharya Institute of Technology and external guide Miss Harshita S, HR Manager at PATTERN EFFECTS LABS PVT. LTD., Bangalore.

I also declare that this Internship work is towards the partial fulfilment of the university regulations for the award of degree of Master of Business Administration by Visvesvaraya Technological University, Belgaum.

I have undergone a summer project for a period of Ten weeks. I further declare that this project is based on the original study undertaken by me and has not been submitted for the award of any degree/ diploma for any other University/ Institution.



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ACKNOWLEDGEMENT

I deem it a privilege to thank our Principal, **Dr. Sharanabasava Pilli**, **Dr. Mahesh**, Dean Academics and **Dr.Nijaguna** G. HOD of MBA department for having given me the opportunity to do the project, which has been a very valuable learning experience.

I am truly grateful to my external guide Miss Harshita S, HR Manager at Pattern Effects Labs Pvt. Ltd. and my internal guide, Mr. Swarupa Ranjan Panigrahi, professor in MBA department, AIT Bangalore for their research guidance, encouragement, and opportunities provided.

My sincere and heartfelt thanks to all my teachers at the Department of MBA, Acharya Institute of Technology for their valuable support and guidance.

Last, but not least, I want to express my deep appreciation to the helping nature of employees at Pattern Effects Labs, Bangalore for their support.

YUGANTAR MISHRA

USN: 1AZ16MBA84

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EXECUTIVE SUMMARY

The trading in commodity market usually works around primary economic sector. Agricultural products are the soft commodities. With commodity being such a widely used article, it is traded in over more than 50 markets worldwide. The topic undertaken for the research and study is:

"A Study on volatility of selected Indian agricultural commodity prices in India." Present study is undertaken for analyzing the behavior of the individual commodity prices and their relative impact on the agricultural commodity index price in NCDEX.

India being an agro heavy country, the progress and development of the agriculture have a riveting impact on the GDP of the nation. The agricultural index actively affects the GDP and can be considered as the real time indicator of the Nations growth considering the fact that more than 60% of India's economy is contributed by the agricultural industry. For the purpose of analysis, data considered dates from 1st Jan 2015 to 31st Dec 2017, spanning over a period of 3 years.

The study mainly focuses on the determination of interdependency of the agricultural index corresponding to the change in prices of selected agricultural commodities. A market where trading of raw or primary products takes place is known as commodity market. This study would positively assist the investors in relevantly co relating the index price movement in Indian market with respect to that of the commodity price movement.

Considering the results obtained from the T test it was found that except for one commodity out of the five considered under the study has a significant impact of price movement of index, whereas others remained independent and unaffected. Also, on the basis of results obtained through the one way ANOVA test it could be explained that there was no significant difference in the performance of selected commodities against the price movement of the commodity index.

CHAPTER1

INTRODUCTION

1.1 INTRODUCTION ABOUT PROJECT

Project is typically a learning process where the information flows from an organization to a student. This whole mechanism provides for imparting direct exposure of industry experience to the young individuals. This may involve job shadowing, subordination, minor responsibilities which prepares an individual for actual work. An individual undergoes Project to get acquaint with the norms of corporate world closing in on the gap between theory knowledge and the practical scenario. This Project's structure varies from company to company and is based on the domain of the individual. Accordingly, the period may vary anywhere between 3 to 6 months with individuals shuffling across departments to know the complete workflow. These could be paid or unpaid based on the company policy and requirements.

Project provide assistances to students looking to attain work exposure in the preferred field. One of the main objectives of undertaking an Project is to obtain industry insights through acting over real life scenarios. It tests an individual's ability to implement decisive moves under pressure situations. Moreover it imparts value addition to his life leading to a positive corporate transformation. Based on the performance over the Project, the organization may decide to offer a full time role. Most often the companies tend to provide a pre placement offer, but it completely rests on the hands of the administration and is neither mandatory nor guaranteed.

While my Project at Pattern Effects Labs, a subsidiary of EDINTURE LABS. PVT LTD., I gained insights on the structural workflow of the corporate. Having assigned the role finance analyst intern, I participated in daily trading on the Zeerodha Pi software.

This Project's structure varies from company to company and is based on the domain of the individual. Accordingly, the period may vary anywhere between 3 to 6 months with individuals shuffling across departments to know the complete workflow. These could be paid or unpaid based on the company policy and requirements.

1.2 INDUSTRY AND COMPANY PROFILE

1.2.1. FINANCIAL MARKET

The assortment of probable people (viz. buyers and sellers) who are indulged in trade of convinced goods, services via a series of transactions among them is called market. The marketplace which indulges in buying and selling of commodities, financial securities and other fungible items of low transaction cost is named as financial market. Within financial market the agricultural products and metals are categorized under as commodities whereas the stocks and bonds come under securities.

1.2.2. COMMODITY MARKETS

A market where trading of raw or primary products takes place is known as commodity market. Mainly in the commodity market, categorization could be classified as soft and hard commodities. The hard commodities comprise of mined materials such as natural gas, crude oil, gold, silver etc. whereas soft commodities comprises mainly of agricultural products like cocoa, pepper, soybean, oats, coffee etc. Commodity market trading incorporates both physical trading and derivative trading. Over the world there exist 50 major commodity markets and a number of minor markets as well. There are a number of commodity exchanges in India namely listed as NMCE, MCX, NCDEX, BOOE, COC, ICEX and ACE. In these markets the derivative trading takes place. The four major components of trading in the commodity market are options, spot, futures and forward. The commodity market has its own index which gives an insight of the market's current trend. It is known as Commodity Price Index. It can be defined as a static weight index or average of particular commodity costs which might be centered on the spot or future prices.

1.2.3. SPOT MARKET

The market in which commodities and financial instruments are instantly delivered once the transaction is finished is known as spot market. This is public marketplace and is even recognized by the name cash market is many regions. In the spot market the commodities are traded at current m arket price of the commodity. The settlement procedure for a successful trade takes no more than t+2 days. In Indian commodity market trading can take place through various ways, either it can be over the counter or ideally through an exchange. Over the counter is abbreviated

as OTC and in this market the trades aren't abided by the exchange rules but go on the basis of the contract employed between 2 parties instead.

1.2.4. FUTURE MARKET

Also known as the future exchange, here in this market the delivery of future contracts and commodities is carried out on a specifically agreed upon future date. Since the trade takes place on a future specified date the prices applied are also future specified prices. It is because of these rules and regulations of the future market that oppositely differentiates it from the spot market. The price of the future contract is altered periodically based on certain underlying assets such as physical commodities, index and stocks. Having their values dependent on another class of assets, they can also be categories in under as "Derivatives."

1.2.5. STOCK EXCHANGE

The plethora of different markets where entities such as equities, bonds and other securities are traded is called stock exchange. It contributes as one of the most essential fragments of free market economy since the investors sight an opportunity to gain a slice of ownership and also facilitates the company's access to capital. They frequently take part as continuous auction markets, with buyers and sellers accomplishing contacts at a central position, such as floor of the exchange. To be essentially able to carry trading of a particular security, it must be listed in a government certified exchange.

1.2.6. SEBI

Established in the year 2nd April, 1992 under 1922 SEBI act, Securities and Exchange Board of India monitors the complete process of trading in the Indian trade market. It was formally setup to protect investor's interests and their rights. The SEBI is a centralized body governing the Indian trade market. The central body for trading in India is headquartered in Mumbai, Bandra Kurla complex. The major utilities that SEBI facilitates are,

- Protective
- Developmental
- Regulatory

1.2.7. MCX

India's major self-governing commodity exchange MCX is a commodity future exchange where enormous amount of turnover is observed. Within this market the buyers and sellers trade in products from the sectors including agriculture, energy and non-ferrous metals etc. With its presence in websites viz. economic times, money control, live feeds are telecasted for all live trades.

1.2.8. NCDEX

One of the most proficiently managed online multi commodity exchange the NCDEX constitutes of companies, public sector banks and national level institutes as the shareholders group. Profoundly it holds the distinction of being only exchange upheld by national level institutes. Trading in more than thirty one agri and non agri commodities it is headquartered in Mumbai.

1.2. COMPANY PROFILE:

PATTERN EFFECTS LABS

PatternEffectslabs is a start up company established on 24th of May,2017.which works on stock market especially on options . In recent days it is also developing a software for getting clients and also for the public which is a paid service. To develop that software there has to be a lot of technical and as-well- as fundamental analysis is required and the company is currently working on it. The parent company is EDINTURE SERVICES.

1.2.1 Directors of PatternEffects Labs PVT LTD:

- ShashilumarJagatageri Math
- Shivshankar Das.

1.2.2 About Edinture

We are a Skill development company founded by Industry veterans to fulfill skill gap existing in market today. The fields amongst which Edinture specializes include sourcing - training - assessment – training – on boarding, which cuts across the complete life cycle of recruitment. To mystically bring down the cost incurred for the purpose of training and hiring, we have specifically designed solutions, crafted – designed and implemented to ensure critical financial saving in the

costly process of not only hiring the employees but also to train them. We cater according to the needs and hence have predesigned management services providing end--to—end manging of the available talent pool. We mostly employee “HIRE>THE>ASSESSED” , “HIRE>AND>TRAIN” and “TRAIN>THE>HIRED”.

Within the schooling and education sector our services are broadly distributed into development through learning thereby working with each and every kind of schools including private schools, public schools and also the one that fall into the k12 sector. To counter the most pressing issues challenges to maintain the discipline in schools, we work directly with the support staff and teachers.

With k12 spectrum the largest growing sector, India being a young nation, we have a wide range of professionally designed services which we offer “to the students, parents, to the teachers and every who falls in the k12 category. With our moto to impart education and excellence to kindle every students hidden potential we have designed solutions improving growth of individuals leading them to excellence. We have a established status for brilliance in giving supreme springiness and amalgamation of teaching-learning resources.

OUR TEAM

We have more than 20 years' understanding of working with schools, universities, colleges, associations, nearby specialists and foundations with a demonstrated reputation of showing and sharing powerful learning systems. Our group originates from an assortment of foundations in instruction, innovation and administration.

1.2.4 PROMOTERS, VISION, VALUES AND STRATEGIES:

VISION: “To become a most respected corporation in financial services space in India.”

VALUES: PATTERN EFFECTS LABS works with the individuals and companies that fit into their professional values. In all the dealings done, they serve the customers giving more importance to moral values. PATTERN EFFECTS LABS works on the concept of FIT, Fairness, Integrity and Transparency.

- Fairness in the business made with stake holders like customers, employees & vendors.

- Integrity in all business prospect and no compromise in the delivering the quality services to customers.
- Transparency in all the business activities with media, public, investors and customers.

STRATEGIES: There are 3 main strategies of Pattern Effects Labs Customer:

- Give service to unexploited rural and semi urban areas as they are safe from competition.
- Give a better quality service and use the knowledge available to focus mainly on retail sector.
- Be a one stop shop to the clients by means of broad multi modal network.

Business:

- Innovate and keep the pricing low.
- To influence Superior financial decisions, the key is Knowledge.
- Diversify the products and services to reduce risk and gain high income.
- Don't switch from the heart of financial domain and adapt to shifting business environment.

People:

- Pull talented candidates and train them to master in the field.
- Educate people to understand their strength in the field of finance.
- Liberal ownership shared.
- Community building and skill set groups to provide a pool of talent whenever there is a mass vacancy.

1.4. PRODUCTS AND SERVICES

1.4.1. Trading

Pattern Effects provides the customers the service to trade in equity, derivatives and commodities.

- Equity trading can be either intraday or a long term trade. It is established broker as well as a depositary participant in India.
- Derivatives are traded on exchanges and are small term trade instruments. Any kind of movable property other than money, securities & actionable claims come under commodities.

  Commodities include silver, gold, pulses, spices, oil seeds and oils etc. Commodity trading provides the benefit of diversification of investment, liquidity and predictability.

1.4.2 Other Services Provided

Talent Supply Chain Management

Fresher Training & Recruitment

We concentrate in Zero Level Talent Management solutions spreading throughout the overall lifecycle of Sourcing, Assessments, Training and On - boarding. Key Benifits of this program are as follows

- Up to 90% reduction in Fresher hiring costs
- Get trained + Assessed fresher at minimal costs
- Reduction in cost for greenfield training of fresher across all niche skills
- Get productive fresher from day 1

Competency Assessment

Our Online competency Assessment is one-of-its-kind service which provides analytical insights on the technical proficiency levels of employees

- Get insights into proficiency levels of employees across multiple dimensions
- Analyze training efficacy
- Plan training and reskill requirements

Skill Developement

Skill Developement For Technical & Business Schools

Elevation of the skills making it reach to the standards that compete with the international norms by the process of continuous engagement and building essential framework of the benchmark which assure to bank on the standards – curriculum – quality assurance.To impart into students the

kind of development which reduces the industry and education gap and hence resulting into fast absorbtion into the market sector.

Swift Mobilization & Recruitment Service

We specialize in recruiting operations for sourcing the best talent in Information Technology for clients . We are able to provide IT professionals competent and skilled in the latest technology and best practices. Key benifits of this program are as follows;

- Get up to 90% conversion rates
- 100% match of candidate profile with requirement
- Candidates interviewed by industry SMEs before sending them for interviews with clients.

Livelihood Center

Emphasis on deprived sections of humanity and recessive areas of the country thereby empowering individuals out of poverty. Likewise, concentration considerably on the disorganized or informal subdivision workforce.

Adorn the role of a "market-maker" by getting the financing or viability gap funding, predominantly in divisions where market mechanisms are futile or totally miss out.

School development and management

School supplies management

We manage procurement activities for the school division, enabling schools, centers, to quickly locate necessary products and services in a timely manner and at competitive prices. This area supports schools by acquiring instructional supplies, textbooks, furniture, equipment, and related services; establishes contracts through the competitive and noncompetitive process and through cooperative agreements with national consortiums; audits accountable equipment throughout the school division; and maintains standard equipment guidelines for equipping new or renovated schools with the necessary equipment and furniture.

Technology solutions For Schools

Edinture is a chief supplier of value instructive administrations offering world-class answers for improve the Online instructive condition all around. The one-stop-site for advancement, e-learning, correspondence arrangements, Edinture works with experienced instructors and technocrats over the globe in planning and creating computerized instructive assets, entrances and

learning administration frameworks for enhanced correspondence and simple access to syllabus-particular lessons on Science, Mathematics, English and Social Studies. Be it computerized content on 3D, web based mentoring administrations, ICT courses or School Online Information Systems, every one of our items, instructive apparatuses, preparing and bolster material and administrations are very much inquired about and tried, giving suitable answers for make understudy progress at all levels. Since there is a need of well networked region to work effectively, the location of the organization aids profoundly in the regular office work. To counter the most pressing issues challenges to maintain the discipline in schools, we work directly with the support staff and teachers.

1.5. INFRASTRUCTURE FACILITIES

Pattern effects labs is a subsidiary company to Edinture Labs Pvt ltd. The registered office is situated in the main area of the Bangalore city. The registered office is located at JP Nagar 5th Block, ahead of the JP Nagar Police station. Even though being a recent startup, it has a well eshtablished office with an employee holding capacity of around 70-80. Since there is a need of well networked region to work effectively, the location of the organization aids profoundly in the regular office work.

1.6. COMPETITORS INFORMATION

a. Motilal oswal securities

b. BNP Paribas

c. ICICI direct

d. Kotak securities

e. Reliance securities

Motilal Oswal Securities

Having 30 years of experience in wealth creation, Motilal Oswal has been awarded as “Best performing equity broker in India” 4 times continuously. Situated in more than 2200 locations having customer base of more than 9 lakh, it is a business leader. They give advice on equity,

commodity, mutual fund and currency markets. Access is granted through web, mobile, desktop & tablet. Motilal oswal has customized strategies to suit different customer requirements.

Reliance Securities

It is the subsidiary of reliance industries which is a broking agency of reliance capital. Being one of the biggest broking firms it has nearly seven lakh customers and present in more than 1700 location in our country. Being a member of BSE and NSE it provides access to derivatives, mtual fund, equities, corporate fixed deposits etc. It is a one stop solution for investors as it provides following services.

- General Insurance
- Trading Products
- Trading Instruments
- Smart Trading Platforms
- Research

Kotak Securities

Being started in 1994, it is a subsidiary of kotak Mahindra bank. It is India‟s best broker today. It has 224 crore rupees as Asset Under Management. Customer accounts of 11.95 lakhs, trades happening 5 lakhs per day, 1209 branches around 359 cities. Following are the features of kotak securities

- Stock broking services
- Portfolio management
- Stock broker and depositary participants: double benefit
- Better research know-how
- Market data up to date
- International information contact

ICICI direct

The retail trading & investment service from ICICI securities is called ICICI direct. Country‟s top financial service provider ICICI, gives banking and other investment options. It gives broad prospectus of investment ideas. Through ICICI direct over 20 lakh customers avail the service of trading online. The special feature is that, it provides a 3 in 1 account which is constituted by trading, demat and bank account. Following are the products offered by the ICICI group.

- Derivative trade
- IPO and mutual fund
- FD
- Loan
- Equity trade online

1.7. SWOT ANALYSIS

Strengths

- Reasonable brokerage charges.
- Wide range of investment products.
- Highly experienced financial advisory team.
- Accomplishment of implementing Insurance Broking Model.

Weaknesses

- Delays in processing the applications of new customers.
- Lesser number of bank tie ups for fund transfers.
- Lack of concentration on advertisements, resulting in low brand awareness.

Opportunities

- As India is a growing economy, more chances of increase in investments.
- Urbanization helps the brokers to enter more and more cities & towns.
- Innovation in IT sector helps the companies to provide better financial services 24*7.
- Growth of capital market

Threats

- Foreign firms entering the Indian market.
- Financial firms coming up with better marketing strategies to attract more customers.
- Changing economic policies in India such as taxation procedures.
- Recession in the economy.
- Dynamic change in the global market policies.

1.8. FUTURE GROWTH PROSPECTS

PATTERN EFFECTS LABS is having a well-built information technology team which helps to develop the applications needed for the near future so as to ease the work of customers. The technology is also outsourced from reputed suppliers to get better quality experience. Improvement in IT also helps to develop new products and services and makes the company to serve customers all the time.

At PATTERN EFFECTS LABS they use open source applications, which help to improve the productivity of the employees while reducing the cost of technology.

PATTERN EFFECTS LABS has been certified ISO 27001 for brokerage, software improvement and demat services. PATTERN EFFECTS LABS is even concentrating on CSR activities by conducting some activities related to health, education, women empowerment, etc through PATTERN EFFECTS LABS foundation. Within the schooling and education sector our services are broadly distributed into development through learning.

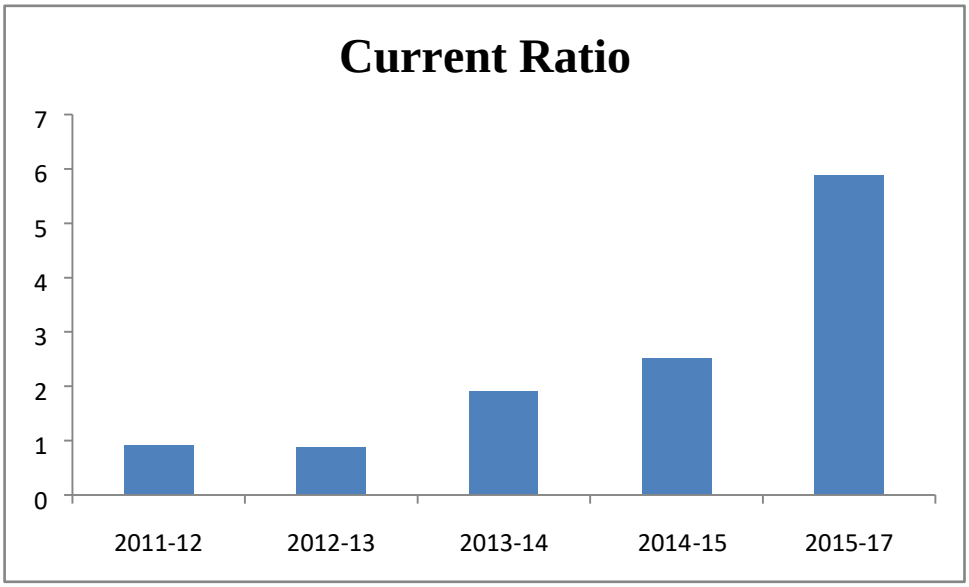
1.9 FINANCIAL INFORMATION

Table 2.1 Table showing current ratio

Year	Current Asset	Current Liability	Current Ratio
2011-12	8779.65	9675.90	0.91
2012-13	6632.78	7515.42	0.88
2013-14	198.17	103.24	1.91
2014-15	470.04	187.40	2.51
2015-17	805.75	137.18	5.87

Source: Data from company yearly report

Chart 2.1 Chart showing Current Ratio



Source: Data from table 2.1

The ratio of total current assets to that of "total current liabilities" provides the current ratio. In the above graph we can see that the current ratio is escalating tremendously. In the financial year

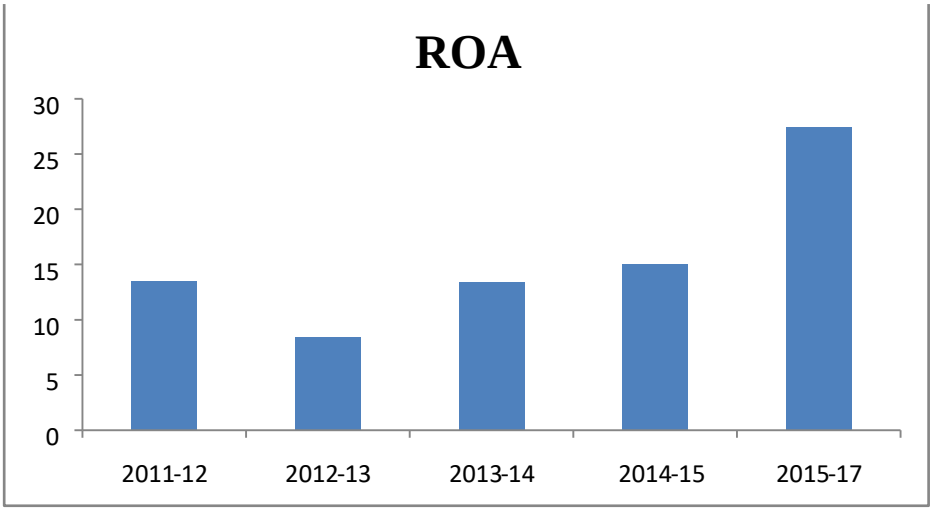
2015-2017 the current ratio is the utmost. The 2:1 typical of current ratio is hence fulfilled by the organization. The current ratio presentation indicates that company is in good position to meet the liabilities.

Table 2.2 Table showing Return 0n Assets

Year	Net Income	Total Assets	ROA
2011-12	6246.37	94991.77	13.5
2012-13	5504.72	131047.05	8.40
2013-14	886.67	13250.57	13.38
2014-15	1100.45	14681.02	14.99
2015-17	2114.1	15402.97	27.45

Source: Data from company yearly report

Chart 2.1 Chart showing Return on Asset



Source: Data from table 2.2

Return on asset shows the company's capacity to use the assets to produce income. We can see in the graph evidently that in 2012-2013 the returns have been diminished. Company has failed to use the assets proficiently. Later point of time the returns have been incessantly increasing and company has maintained uptrend in return generation. In the year 2015-17 being the utmost of all.

One of the classic measures which indicates the liquidity of an organization is the Current Ratio. The ratio indicates that weather an organization shall be able to pay its existing debts which are due within a period of 1 year, by exhausting its current assets. It can usually reveal the "cover" that a business has for every 1 re owned by the firm. The ROA explains that what could be actually achievable by the firm by exhausting the available pool of resources. Commonly, the ROA calculation is usually employed internally to improve on the asset use over the passage of time. It can be used to evaluate value of financing in mounting new system versus using current operation.

CHAPTER: 2

CONCEPTUAL BACKGROUND AND LITERATURE REVIEW

2.1. THEORETICAL BACKGROUND

Indian commodity market is regarded as one of the firstborn markets. One of the major purpose of conducting this study is to analyze and recognize the relationship between prices of selected commodities with that of the agricultural commodity index. For this purpose the property of volatility of price is compared. Volatility can be defined as the extent of uncertainty related to the commodity prices. The agricultural commodity market index and agricultural commodity price are studied co-relatively via this study.

Commodity Market:

A market where trading of raw or primary products takes place is known as commodity market. Mainly in the commodity market, categorization could be classified as soft and hard commodities. The hard commodities comprise of mined materials such as natural gas, crude oil, gold, silver etc. whereas soft commodities comprises mainly of agricultural products like cocoa, pepper, soybean, oats, coffee etc. Commodity market trading incorporates both physical trading and derivative trading. Physical assets secure the Futures.

Some of the agricultural commodities are,

- Things we drink – Coffee, cocoa, sugar and orange juice.
- Grains – rice, soybean, oats and corn.
- Things that are not edible such as cotton, jute etc.

Spot market:

The market in which commodities and financial instruments are instantly delivered once the transaction is finished is known as spot market. This is public marketplace and is even recognized

by the name cash market is many regions. In the spot market the commodities are traded at current market price of the commodity. The settlement procedure for a successful trade takes no more than t+2 days.

Commodity Index

DHAANYA

DHAANYA is an adopted term from Hindi language which means bountiful crop, prosperity and plenty of crops. The benchmark for determining and setting Indian future agriculture prices is DHAANYA. Since the calculated values are based on average of all the commodities in the market, it becomes a value weighted index. To calculate the value of this index agricultural commodity prices of 10 highest liquid future values are considered.

Commodities Studied

a. Cotton

b. Barley

c. Turmeric

d. Coriander

e. Mustard seed

The above commodities were selected as they are the business crops of India which are mainly traded at high values in the NCDEX. These commodities are traded regularly in the commodity market and has a subtle fluctuation trend. Rice and wheat futures are also traded at NCDEX, but rice having a number of different quality and types, would have resulted in large scope of study.

Barley

One of India's most prominent cereal grain, barley biologically belongs to the grass family. Amongst the most necessary atmospheric condition to nurture Barley is high temperature range. Due to this property requirement barley is grown worldwide in the regions with annually hot climate. Its cultivation dates back to as long as human history is known, being the first ever crop

to be farmed. It dates back to more than 1000 decades ago. Apart from being a major crop, the roughage generated during its harvesting is also very much usable. Barley can be used to produce a variety of beverages including beer through the process of controlled fermentation. Barley ranked 4th in the magnitude of production list in the year 2017.

Over the past 10 years the production quantity in India has varied from 1.20 to 1.69 million mega tone. Since it annually requires regular high temperature range for best production, ideally north western states of India are the biggest producers, Rajasthan being the forerunner amongst them. As Jaipur is the capital to the state, it acts as a major trading center for the future contracts of Barley. Having being the producer of large quantities of barley, India are a major exporter of it as well. On the basis of past export data, it is inferred that highest exports of barley were recorded in the years 2007 and 2008. The major importers of barley to which India exports are Kuwait, Saudi and UAE.

Coriander

Coriander leaves popularly known by the name "Dhaniya" in India is cultivated as a major spice crop. The coriander is the preferred choice used in Indian cuisine as a flavoring ingredient. Although there are other nations involved in farming of Coriander viz. Russia, France, USA and Mexico, the kind of flavor they generate differs from region to region. Based upon the climatic conditions demanded to cultivate it are suitably found during mid-November and then harvesting is preferred in February. "Dhaniya" become a major flavoring ingredient India consumes around 1.5 lakh tones per year. Also, apart from being the largest consumer, we are the prime manufacturer and exporter as well. Over the past four years there is a rising trend in the exports.

Since India dominates the total cultivation with as much as half the total worldwide coriander being grown in our nation, the demand and supply drastically affect prices of coriander. The volume of business made since Dhaniya futures introduction in NCDEX in August of 2008 is tremendous. Baring no barrier to entry and exit of traders, the contract is a liquid contract.

Mustard Seed

These are the minute round seed ranging between 1 to 2mm in diameter are popularly known as by the Hindi term "Jeera". Within India there are a number of verities produced mainly

categorized as black, brown and white Indian mustard. Possessing rich protein value and oil generation rates them as an utmost significant ingredient in Indian cuisine.

With large production of seeds, oil extraction industry is also a flourishing business. For this majorly mustard seed and rapeseeds are used. Generating around an annual quantity of 6.5 to 8 million mega tones, India ranks as 3rd amongst the forerunners in annual production. There is both enormous supply and demand for the seeds in India and thus the prices fluctuate based on the same. It being a major crop grown in India NCDEX introduced a mustard contract in the February of 2004. RMSEED futures are superlative to accommodate for the price risk supervision.

Turmeric

Having a multidimensional use varying from a cuisine spice to being used as a sacred spice, turmeric also renders medicinal values. Having such core multipurpose uses it is regarded as the "Golden Spice" of India as it resembles the golden yellowish color of metal gold. The cultivation of turmeric spans over 9 months and is profoundly grown in the regions including America, Africa, Asian countries and Caribbean island.

Being a most suitable terrain and having accurate climatic conditions makes India the sole leader with nearly 90% of the world's turmeric production being done in the nation. With as high as 9.3 lakhs of ever increasing production capacity, nearly 8% of the production is exported. The price is dependent on domestic factors. The sale of turmeric contract has seen a considerable increase since its introduction in 2004 to NCDEX. With cash and carry opportunity to the traders, it is highly traded.

2.2 LITERATURE REVIEW

R Chakrabarty and Rahuldeb Das (2010) made a concentrated the impact of subordinate exchanging on unpredictability with regards to ware market of India. This paper includes information of the horticultural ware record MCXAGRI and a portion of the farming wares. For this situation data streams from Futures market to Spot advertise. Likewise demonstrates that the ware advertise in India impacts the developments of securities exchange.

Ranjit Chakrabarty and Asima Sarkar (2010) influenced an exploration on qualities of the Indian product fates to market to think about if the estimating of the items impact the effective

working of the market. GARCH demonstrate is utilized to discover the data stream of ware fates. Product spot showcase files and future market records are co incorporated with each other is the conclusion.

Terrance Grieb (2012) made a give an account of item fates mean and instability transmission. This investigation utilizes a two-advance GARCH-M methodology to examine cost and instability overflow impacts between 9 product prospects contracts. Study speaks to an example of value overflows that demonstrate the value development for a product is relied upon to have data that is exchanged to different items.

Hans.R.Stoll and Robert-E-Whaley (2010) contemplated the product file contributing and item fates costs. The investigation was made to give a finish of whether ware record putting is a troublesome power in item future market all in all. The examination reasons that the abundance theory by financial specialists has hindered the adequacy of the agreement at being a viable hazard administration device.

Wasim Ahmad and Sanjay Sehgal (2014) made a concentrated the destabilization impact in India‟s agrarian ware showcase. EGARCH show has been utilized to evaluate the spot showcase timevarying instability. The examination applies straight and non-direct causality tests. This investigation infers the negative effect of over-strength of the prospects advertise on spot showcase unpredictability. Henceforth it is important to set-up devoted money related engineering that can gauge and deal with the danger of high instability of spot showcase.

Neil Kellard, Paul Newbold, Christine Ennew & Tony Rayner (1999) considered the relative proficiency of the item Futures markets. The investigation utilizes co combination procedure to distinguish the impartiality and proficiency over a scope of product and budgetary prospects showcases and builds up a measure of relative productivity. Study proposes that fates and spot costs are co incorporated with a long-run slant coefficient of solidarity. Be that as it may, there is confirmation of wasteful aspects in a large portion of the business sectors considered in short run.

Shaik Masood & T Satyanarayana Chary (2015) made a co reconciliation and causality investigation on value disclosure and market of future market of products. By utilizing time arrangement investigation devices, keeping in mind the end goal to decide the value disclosure, short run flow and long run showcase proficiency Indian item advertise is considered. Instruments

like Eengle and Grranger co combination teest and Johaansen co coordination teest haave beeen connected, which presumes that Indian product showcase is effective.

Brajesh Kumar & Ajay Pandey (2013) considered the proficiency of Indian item prospects advertise by utilizing distinctive kind of advantage evaluating models. Study demonstrates that when long-run effectiveness is considered spot costs have co incorporation with close month fates costs of huge numbers of the products. The relationship of cointegration isn't discovered when exchanging volume of fates is low that is by prospects contracts.

G R Sayee Prasanna (2014) utilized the Johansen's co incorporation and Granger causality and Johaansen's Vecctor Eror Corection Moodel (VECM) too discover holes in working of horticultural ware prospects. He found that at first request log fates and log costs are stationary. Utilizing Johansen‟s co joining test long run balance amongst future and spot costs is built up.

Delphine Lautier (2015) completed a hypothetical examination of term structure. 4 factors that are by and large utilized incorporate the comfort yield, spot cost, long haul cost and financing cost. Ware evaluating writing patterns amid prior years show future bearings for inquire about.

Stephen J Turnovsky (1983) made an investigation on storable item finding the impacts of fates exchanging a market. Long run, normal spot cost and the difference of the same are considered and broke down to comprehend the impact of future market on them. The conclusion demonstrates that the future market, bringing down the long run mean balances out the spot cost.

Wasim Ahmad & Sanjay Sehgal (2015) considered the Indian agri item market to think about the destabilization impact. Spot advertise for Chana, pepper and stew indicates impact of product fates considering direct and nonlinear tests. Future approach inquire about is coordinated by the same.

Mantuu Kuumar Mahhalik, Debaashis Achaarya & M. Suuresh Babbu (2014) inspected the unpredictability overflows and value revelation in spot fates product markets of India. Despite the fact that disclosures in a single market will discover the unpredictability in other market, the overflows from future to spot advertise indicate predominance in LENERGY and LCOMDEX and for agri fates showcase the source.

G Naresh, S Thiyagaranjan & S Mahalaxmi (2015) influenced an examination on the Indian product to list cost gouging. The investigation infers that there low exchange cost and high level of feasible use, consequently the lead slack relationship is seen between two markets.

Prabbhati Kuumari Mishra & Kishhor Goswyami (2015) examined how the addvanced fore-casting techniques get better the unavoidability of sugar-futures in commodity:market of India. Using ordinary least square regression the forward premium is predicted. From the estimated data it is found that the volatility is more towards the maturity date of 3 months compared to 6 and 12 months.

C Hussain Yaganti & B Kamaiah (2012) studied the effective hedging of future contracts of commodity for base metals and spices by using method of error correlation and co integration at various time horizons ranging from one to three months that is maturity, nearby and far month. The study concludes that base metals have high hedging efficiency when compared to agricultural commodity futures.

Prof. (Dr.) J. K. Das & Gourab Chakraborty (2015) made a study on hedging concert of commodity market in India. Study concludes that direct involvement of government in to the minute matters of agricultural market is difficult to standout and at some point has to be dispensed.

Ranjit Chakraborty & Rahuldeb Das (2013) made an attempt using Granger causality test to identify the connection between level of future trading and spot price in commodity market of India. For improved clarification of causality, the forecast error variance decomposition has been used. Moreover the causality between the unforeseen futures open interest and volatility of spot price is feeble.

Jabir Ali & Kriti Bardhan Gupta (2011) attempted to analyse the agricultural commodity market effeciency by identifying the affairs between the spot and future prices of main Indian agricultural commodities. The unit test method is used and study suggest that future and spot prices have long term relation for many of the commodities in agriculture.

Sheeba Kapil & Kanwal Nayan Kapil (2010) tried to explain why the Indian commodity market wants the contribution of the CTAs. The new development of commodity market of India has not been prearranged. There have been restrictions in the course of policy limitations and attempt for

liberalization of the commodity market was made at the same time to carry them at same level with international commodity market.

Giorgio Canarella & Stephen K Pollard (1985) reexamined the competent market hypothesis considering future market of agricultural commodities. Commentary has offered ample of empirical tests. Overall hypothesis is supported by ratio test.

Vasanta G and T Mallikarjunappa (2015) made an investigation on lead-slack affiliation and value identification method between future and spot market of pepper in India by methods for Johansen's cointegration test and the bivariate models. The outcome assign that in value disclosure spot showcase is more proficient than the prospects advertise, and consequently, finished the fates advertise spot showcase assumes a central part.

Pratap Chandra Pati and Purna Chandra Padhan (2009) made an investigation on value slack connection disclosure and lead slack connection between CNX, NSE, S&P and clever stock spot list and future records. Study demonstrates that spot cost is leaded by future cost and furthermore performs errand of value development.

Meenakshi Malhotra and Dinesh Kumar Sharma (2015) inspected the fates exchanging sway on precariousness of spot market of guar seed. Guar seed spot wage instability is displayed as a GARCH (1, 1) movement. Open intrigue and Futures exchanging volume are isolated into unsurprising and unusual instrument. Intensified GARCH demonstrate gossip positive compatibility among startling prospects exchanging volume (UTV) and spot returns instability and Granger Causality streams as of UTV to spot unpredictability. Subsequently the instability of spot costs increments unusually when the level of prospects exchanging volume increment.

Daniele Girardi (2012) considered the rural product market to distinguish if the wheat cost is influenced by the money related speculators. In 2008 in the historical backdrop of 30 years, costs of a portion of the fundamental agrarian products demonstrated the most astounding pinnacle and after that fell. Despite the fact that the hypothesis feels fulfilling the proof accessible isn't clear.

Thiagu Ranganathan and Usha Ananthakumar (2014) considered the soybean prospects showcase in to recognize the proficiency of them in India. To think about the market proficiency and the absence of prejudice of the soya prospects exchanged NCDEX, QUARCH M ECM

demonstrate was utilized. At that point it is discovered that in long run soybean prospects are fair and there is showcase in efficiencies in short run.

Prof. Ranjit Chakraborty and Rahuldeb Das (2015) contemplated the variables that impact the product prospects costs in India utilizing polynomial dispersed log demonstrate. Johansen Co coordination test, Vector blunder amendment display, Almon polynomial model are utilized to characterize diverse connections. The investigation uncovers that spotprice, advertise wide data, money related guess and swapping scale of the US dollar control the fates cost.

J N Dhankar (2009) influenced inquire about on the future market to affect on costs and creation of Indian agribusiness. In the investigation it is reasoned that agribusiness of India has a vital and particular brunt on creation and cost of various horticultural products.

Wasim Ahmad and Sanjay Sehgal (2015) made an examination on how the Indian farming ware prospects advertise is influenced by destabilization. Eight items exchanged NCDX are viewed as and their day by day information is gathered. Exact investigation is utilized to discover different attributes like circumstances and end results of future and spot showcase unpredictability. It is bring into being that exact outcomes are in succession with Abhijit sen‟s board of trustees and gives track for included approach explore.

Tarun Kumar Soni (2014) examined the market proficiency, absence of prejudice and the method for causality between 4 horticultural item fates contracts for a guaging prospect of 28 days, 56 days and 84 days that are exchanged NCDX.

Dr. C S Basavraj and Dr. G Prahlad Chowdri (2013) influenced an examination on value revelation of red nippy prospects in Indian item to advertise. They made an ADF test by examining spot and future costs. They presume that red crisp future markets are efficient in recognizing the future spot costs.

Prabhati Kumari Mishra and Kishor A Goswami (2015) evaluated the predictability, of sugar futures in Indian-commodity-market. Different nonlinear and linear methods and least square regression method are used. It is observed that accuracy of forecast is set up better for shorter future prospect.

CHAPTER 3:

RESEARCH DESIGN

3.1 STATEMENT OF PROBLEM

My topic for study is "A STUDY ON VOLITILITY OF SELECTED AGRICULTURAL COMMODITY PRICES IN INDIA".

3.2 NEED FOR THE STUDY

The project is based on the results of study conducted for determining the impact of spot prices of the certain commodities viz. coriander, barley, turmeric, cotton and, mustard seed on the agro index named as DHAANYA. This study analyses if there are any implications in mean returns between the commodities and thus indicates if the prices of commodities are proportional to the price of the index.

The following commodities have been selected on the basis of the large production quantity in India. All these commodities are amongst the core trading commodities in the Indian trading market.

3.3. OBJECTIVE OF THE STUDY

i. To theoretically study and understand Commodity market.

ii. To conceptually analyze the proportional movement of commodity index and commodity prices in Indian commodity market.

3.4. SCOPE OF THE STUDY

The study analyzes data spanning 3 years from 1st Jan 2015 to 31st Dec 2017.

The study documents daily spot prices of 5 agricultural commodities and compares with daily spot price of agricultural commodity index to find a co-relation between them.

3 . 5. METHODOLOGY

3. 5 .1. RESEARCH DESIGN:

Analytical research design is implemented for the study. To understand the relation between sets or groups of data each of them are compared against each other to generate relative data using statistical tests on them.

3.5.2. DATA AND SOURCES OF DATA:

i. Agriculture commodity index's spot price for each day.

ii. Agriculture commodity's spot price for each day.

Multi Commodity Exchange and National Commodities and Derivatives Exchange (MCX & NCDEX) are the sources of data collection.

3.5.3. HYPOTHESIS FRAMEWORK

Hypothesis 1

Null Hypothesis (H_0) -There is no significant impact of Index prices on prices of selected commodities.

Alternative Hypothesis (H_1)-There is a significant impact of index prices on prices of selected commodities.

Hypothesis 2

Null Hypothesis (H_0) –There is no significant difference in mean return among selected commodities.

Alternative Hypothesis (H_1)–There is significant difference in mean return among selected commodities.

3.5.4. STATISTICAL TESTS Return calculation = $\ln\left(\frac{P1}{P0}\right) * 100$

Descriptive Statistics

Basic feature of data considered for study is explained by descriptive statistics. Mean, standard deviation and skewness are considered for the study.

- Mean, $\bar{X} = \frac{\sum X}{N}$

- Standard Deviation, $\sigma = \overline{\frac{1}{N} \sum_{1}^{N} (X - \bar{X})}$

- Skewness – Mean value is larger than or less than 1, skewness is considerable & distribution is far from symmetrical ,

  Skewness = (μ-ν)/σ, μ = Mean, ν = Median, σ = Standard deviation.

Co efficient of Correlation

The formula used to calculate the co efficient of correlation is,

Correlation Coefficient, $r = \frac{n(\sum XY) - (\sum X)(\sum Y)}{[n\sum X^2 - (\sum X)^2][n\sum Y^2 - (\sum Y^2)}$

The degree of association of two variables is defined by the coefficient of co-relation. The COC value ranges from (-1) to (+1). A COC of +1 specifies perfect positive co-relation and (-1) represents perfect negative co-relation. Furthermore we can infer that a positive value indicates a directly proportional relation between both variables, conversely negative correlation shows that upsurge in one value lessens the value of other. Though one shortcoming of correlation co efficient it is unable to that decimate the nonlinear co-relation. The co-relation coefficient can be used to determine the extent or magnitude of change in one variable's value corresponding to the change in another variable.

Regression

Regression equation is specified as,

Y=a+bX

The variables in the regression equation represent dependent variable and independent variable, Y and X respectively. Suitably the equation helps in creating predictions. On the basis of data obtained by calculating Correlation co efficient future predictions can be made for all possible outcomes and plotting this data into the scatter plot generates a straight line formation which can be utilized to discover the predictive function.

Single factor ANOVA

Also known as one way ANOVA, it essentially contributes in examining the null hypothesis. In case there is statistically significant differences between 3 or more independent variable groups, the single factor ANOVA is run to test. The null hypothesis can be determined as follows,

$$H_0: \mu_{Barley} = \mu_{Coriander} = \mu_{Cotton} = \mu_{Mustard\ seed} = \mu_{Turmeric,}$$

"μ" here specifies group mean.

In case, if minimum of the two group means are statistically significantly different from one other, the alternative hypothesis (H_1) is accepted which states that there is significant difference in mean return among selected commodities.

3.5.5. LIMITATIONS OF STUDY

i. Only 3 years is the span data collection period.

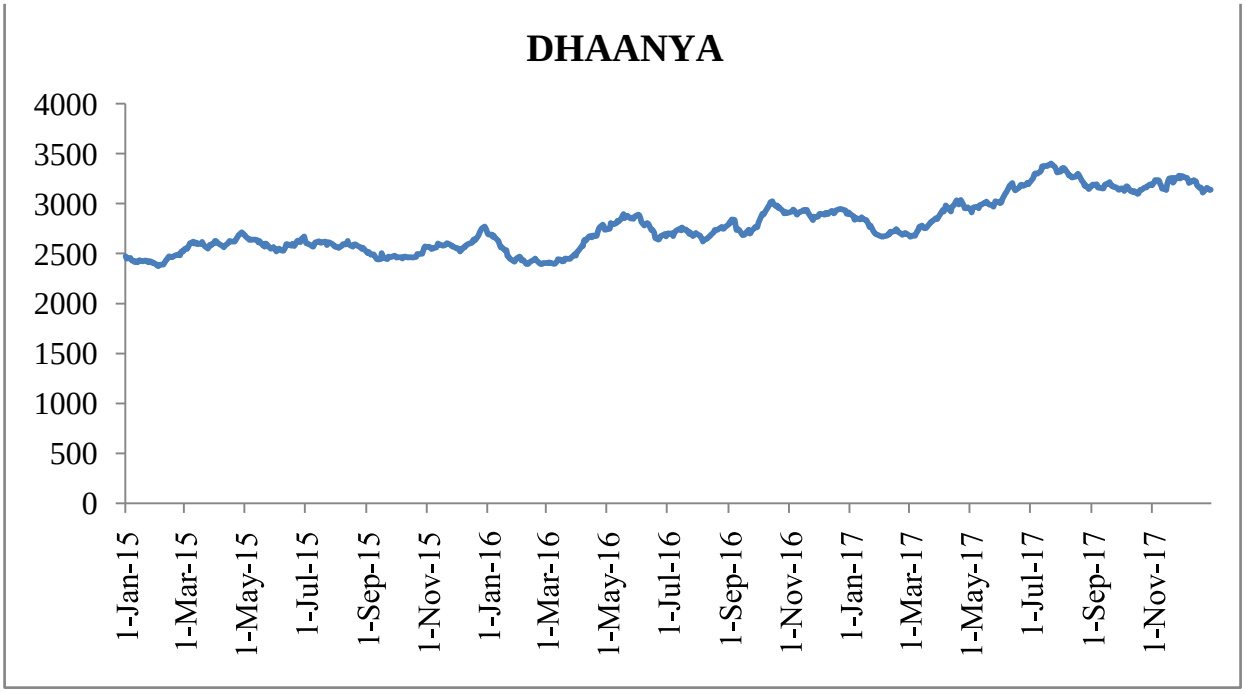
ii. A total of 5 agricultural commodities have been selected for the study.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATTION

4.1. PRICE MOVEMENT

Chart 4.1 Chart showing price movements of index (DHAANYA)

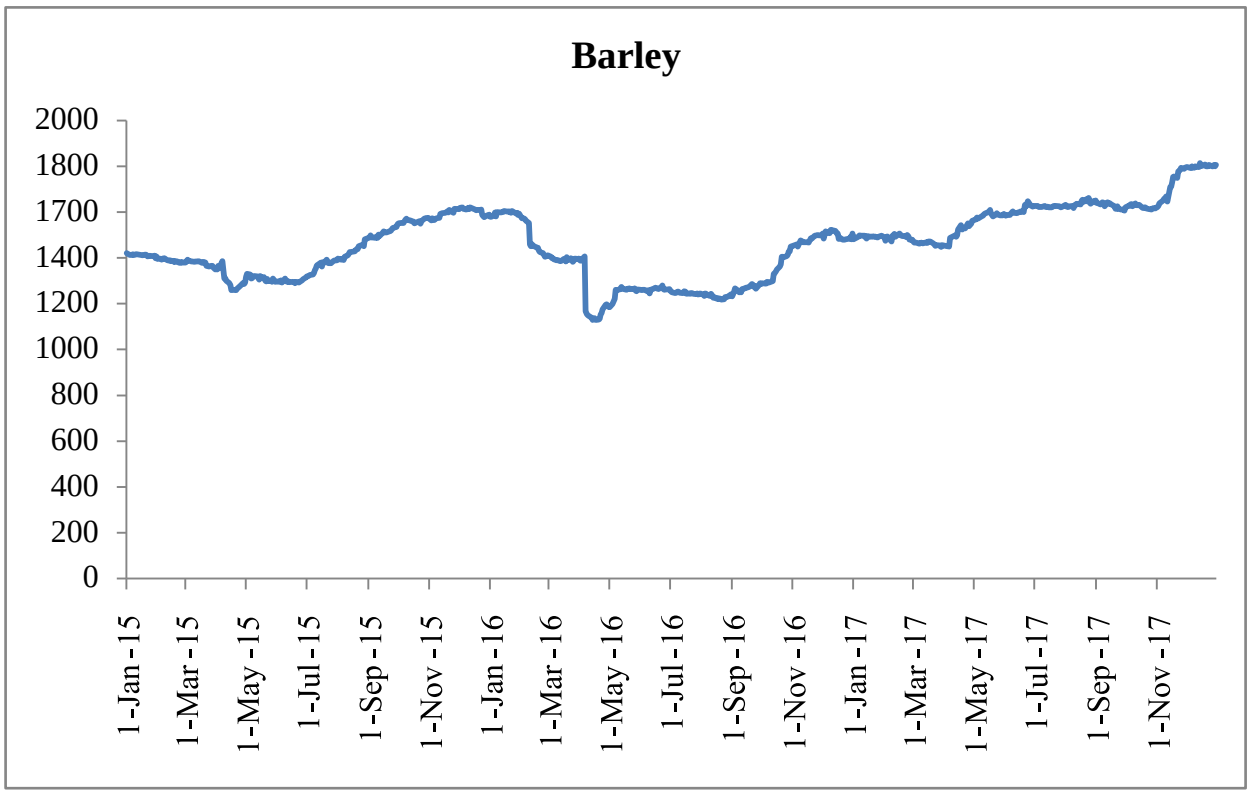


Source: Data collected from NCDEX

Interpretation

Chart number 4.1 is representing the data in a line graph form. The following line graph is depicting the movement of price of the agricultural commodity index which is DHAANYA. For studying the trend followed by this index, data considered is from previous 3 years. As incident in the graph there are no steep peaks and crest showcasing there are no severe rise or fall in the index prices. In the months of January, November and July of year 2017, index peaks are observed. As a general observation it could be inferred that index is in continuing uptrend spanning the period of study.

Chart 4.2 Chart showing price movements of Barley

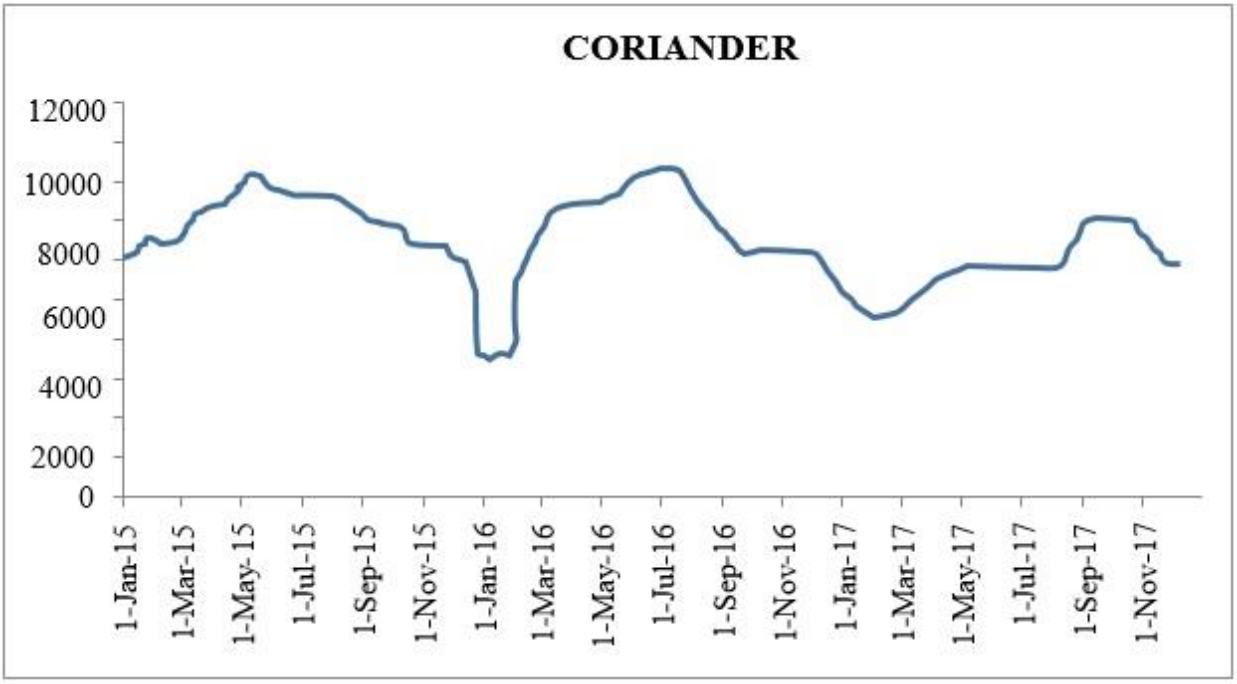


Source: Data collected from NCDEX

Interpretation

Chart number 4.2 represents fluctuations in the movement of price of the commodity Barley, and spans over the period of 3 years. The graph shows peaks and crest as the data varies. Inference made show a steady fall of the price advancing towards May 2015 and there is a regular rise during the January of 2016. With the dent in prices a steep fall can be witnessed in May 2106, following which is again a continuous uptrend until the period of data consideration. From 1400 in the January of 2015, prices have surged to 1800 in the year 2017, for the month of November.

Chart 4.3 Chart showing price movements of index coriander

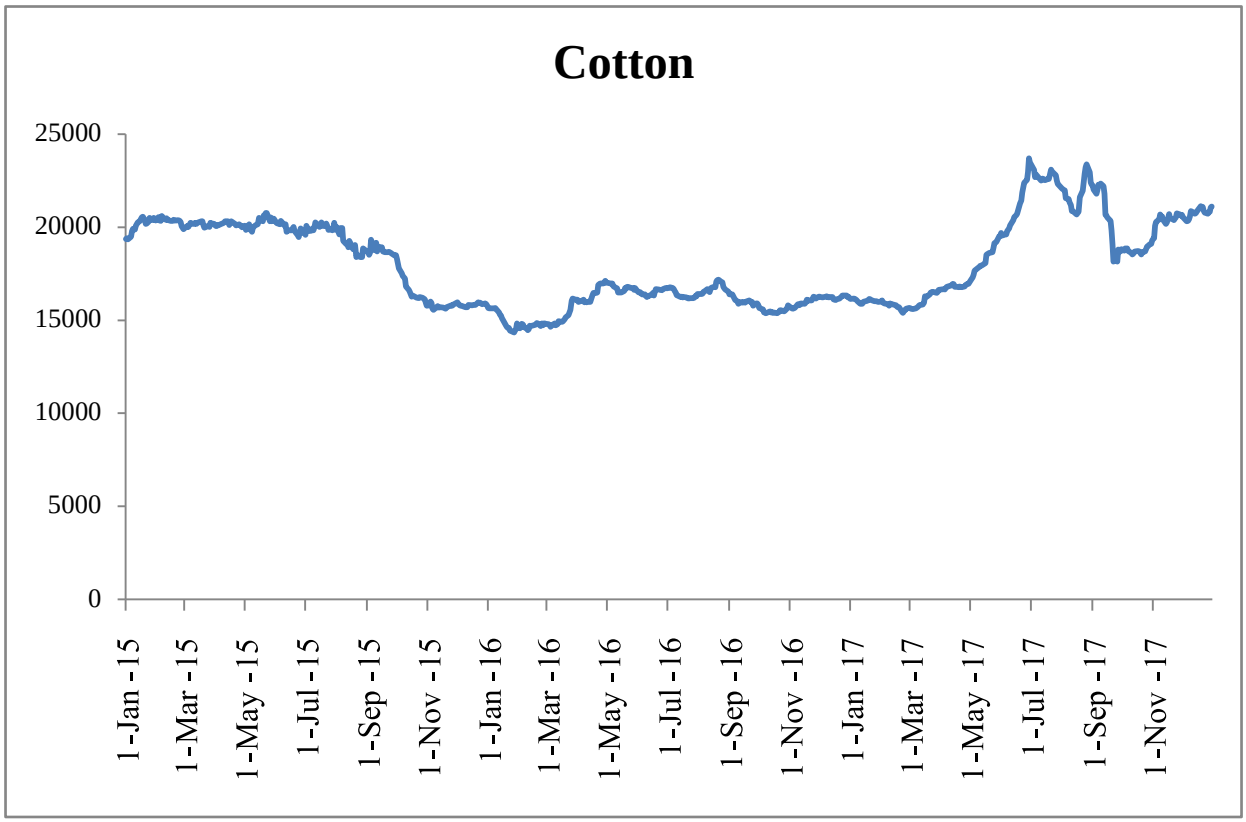


Source: Data collected from NCDEX

Interpretation

Chart no. 4.3 presents the trend is price variation of the commodity coriander for the study period spanning 3 years. Use of a line graph is made to depict the price movement. In the initial study period an exponential upsurge is observed for the commodity price. While the succeeding years had a steep down curve whit a deep crest representing an exponential fall in price viz. ₹12000 through November 2015 to ₹6000 throughout the month of March 2016. While the lowest price is experienced in the month of February 2016, a quick recovery is followed as price touch 1200 mark in May. In later point of the year again a downtrend is initiated from September 2016 which continues till the end of period considered for the study.

Chart 4.4 Chart showing price movements of Cotton



Source: Data collected from NCDEX

Interpretation

The above graph represents the movement of prices for the white fiber crop cotton. By the graph it can be inferred that there is a minimal deflection shown in the cost of the commodity for the initial four months period. Until the March of 2017 there is minimal fluctuation ranging from 15000 to 20000 mark. The movements observed till March of 2017 are fairly gradual. It is only after March 2017, that a price upsurge occurs resulting in rise of commodity price viz. ₹17000 to ₹23000 in the upcoming 2+1 month. In the later months the prices regularly swings and cascades to ₹19000 followed by a continuing increase till the period under study continues.

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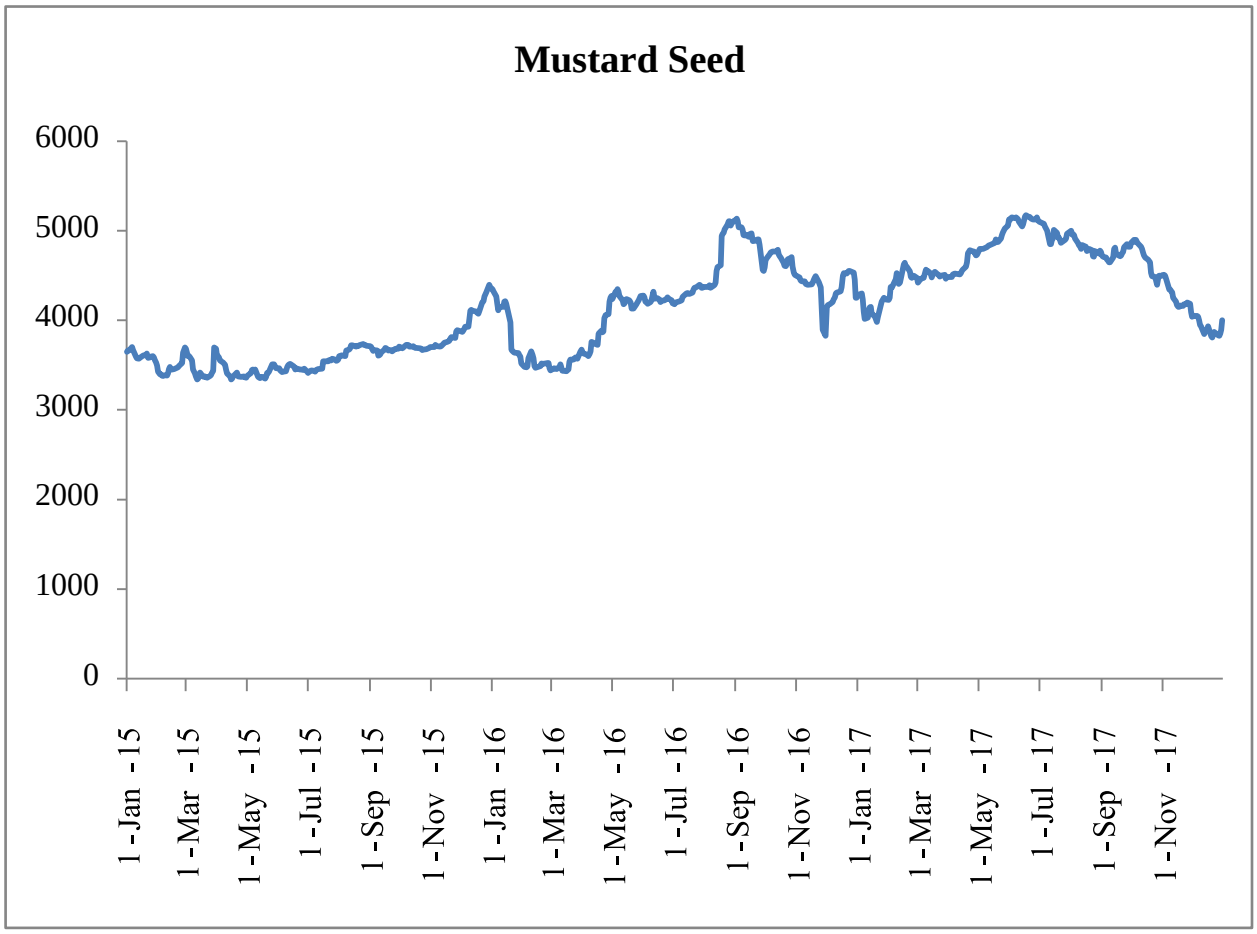
Chart 4.5 Chart showing price movements of Mustard Seed

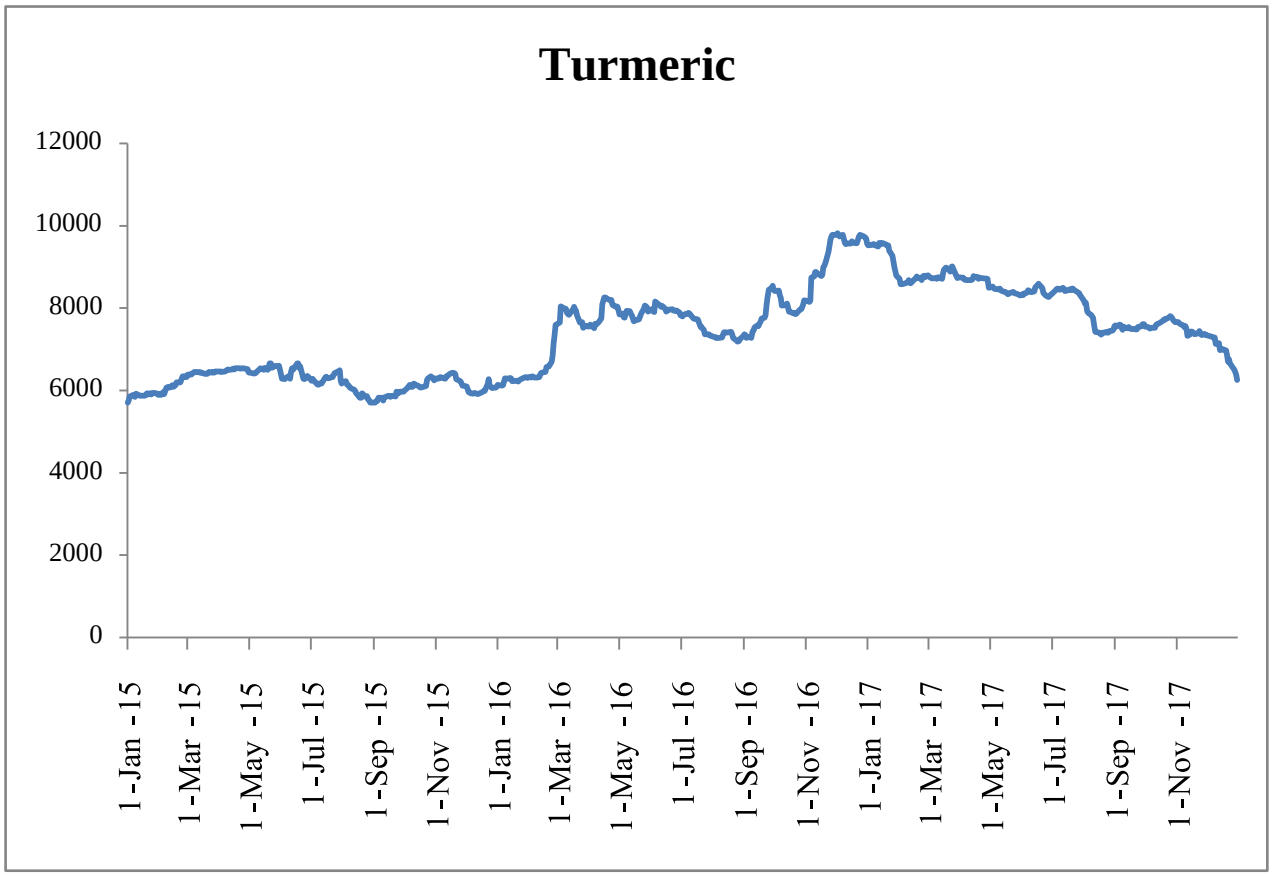


Source: Data collected from NCDEX

Interpretation

In the following chart 4.5, Mustard seed prices are represented with the help of a line graph. As, compared to other commodities under the study, the following graph shows much higher degree of volatility in the price movement. Until the January of 2016, only a minutely gradual upsurge can be seen. In the next two months following, the prices fall by 500 and then carry on the upward movement. With the maximum amount of ₹5000 in the year September 2016, a high peak is formed. The trend observed in the later period of study is found to be camel"s hump formation.

Chart 4.6 Chart showing price movements of Turmeric



Source: Data collected from NCDEX

Interpretation

The golden crop of India, turmeric's price movements are considered to plot the above graph. For the period of study from January 2015 to November 2017 a line graph is used to depict the trend in the movement of price of turmeric. Following the usual trend there is a gradual upsurge in the prices till the month of November 2016, and achieves the highest peak in the same month. Since the peak in November 2016, the movement shows a downtrend until November 2017. The month of January 2017 experienced a steep drop amounting into ₹9000 to ₹8000.

Table 4.1 Table showing descriptive statistics analysis

Sl No	Particulars	Average Return %	Standard Deviation	Skewness
1	DHAANYA	0.0324	0.7386	0.1237
2	Barley	0.0325	0.9747	-9.7752
3	Coriander	-0.0188	1.4121	-0.3813
4	Cotton	0.0130	0.9175	-0.4784
5	Mustard Seed	0.0118	1.1612	0.2278
6	Turmeric	0.0138	0.9312	0.5556

Source: Data from calculations on returns.

Interpretation

In the above Table number 4.1 a statistical analysis data has been presented. The values mentioned are the return obtained by performing calculations on the set of data for all the commodities and in relation with that of the commodity index DHAANYA. From the following table, it is clearly inferred that coriander generates a negative return while the remaining commodities have positive return.

While comparing the percentage return, we find Barley is at the helm with maximum return of .0324%. For the measure of standard deviation again coriander peaks the values, were as DHAANYA has got lowest standard deviation. For barley, coriander, cotton and mustard seed the return is skewed and are approximately symmetric, in contrast the Turmeric‟s return is moderately skewed.

4.3. DEGREE AND NATURE OF RELATIONSHIP

Table 4.2 Table showing Nature of relationship

SL No	Dependent Variable	Explanatory Variable	r	r^2
1	Barley	DHAANYA	0.0280	0.0008
2	Coriander	DHAANYA	0.0783	0.0074
3	Cotton	DHAANYA	0.0013	0.0000
4	Mustard Seed	DHAANYA	0.0529	0.0038
5	Turmeric	DHAANYA	0.0245	0.0006

Source: Data obtained from regression calculation

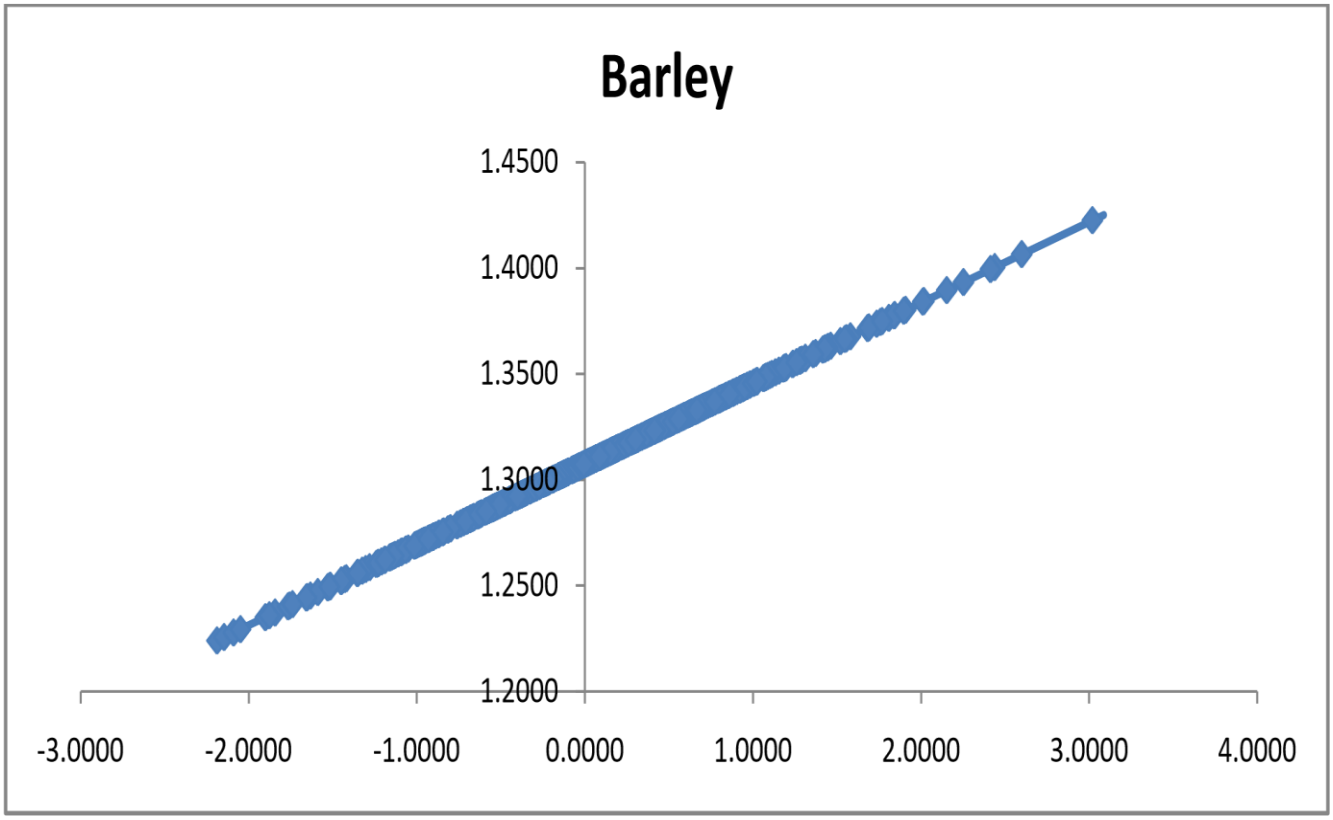
Interpretation

By the calculation results from the Table 4.2 depicting the regression calculation, it can be stated that considered commodities have low degree of positive co-relation with the index. More so, the co-efficient and of correlation is as low as 0.0000001 between DHAANYA as well as cotton, hence mathematically rounding off it can be taken as '0'. This explains that the two variables are in no way co-related to one another. With this stated, we then can infer that neither of the variables possess a significant impact on another variable.

Having a zero co-efficient of co-relation among cotton and index being zero we can state that cotton commodity price movements are independent to that of the index price movement. Clearly, by the table we can say that 0.63% is the maximum which can be measured. Therefore, we can conclude that there is utterly low significance of the commodity index (DHAANYA) on the individual commodity price.

4.4. REGRESSION LINE

Chart 4.7 Chart showing regression between expected return of Barley and return of DHAANYA

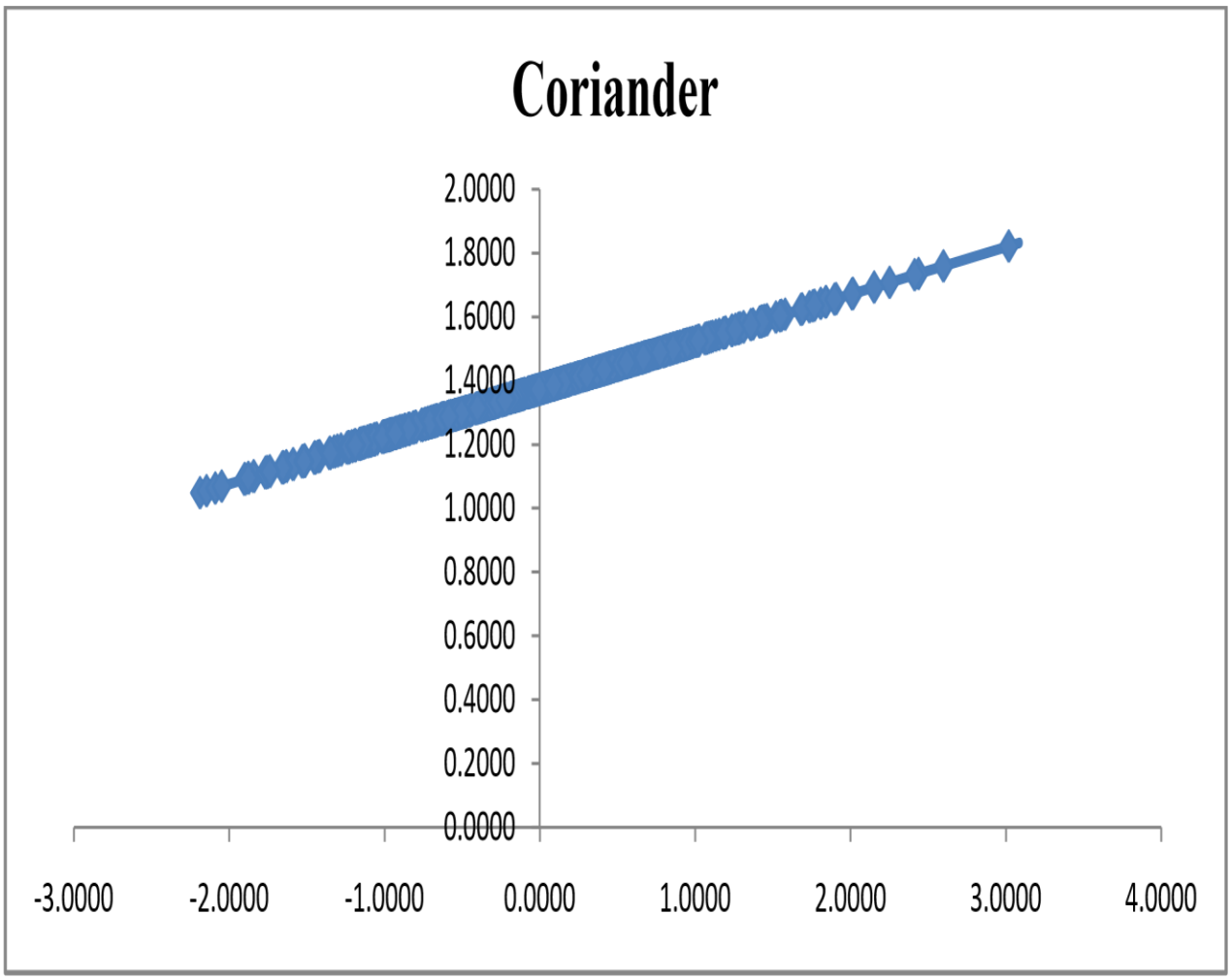


Source: Data obtained from expected return calculation

Interpretation

In the Chart 4.7, a scatter plot with regression line has been depicted for the commodity Barley. With the help of regression output the barley's expected return is plotted against the returns of commodity index DHAANYA, thereby providing a straight line plot.

Chart 4.8 Chart showing regression between expected return of Coriander and return of DHAANYA



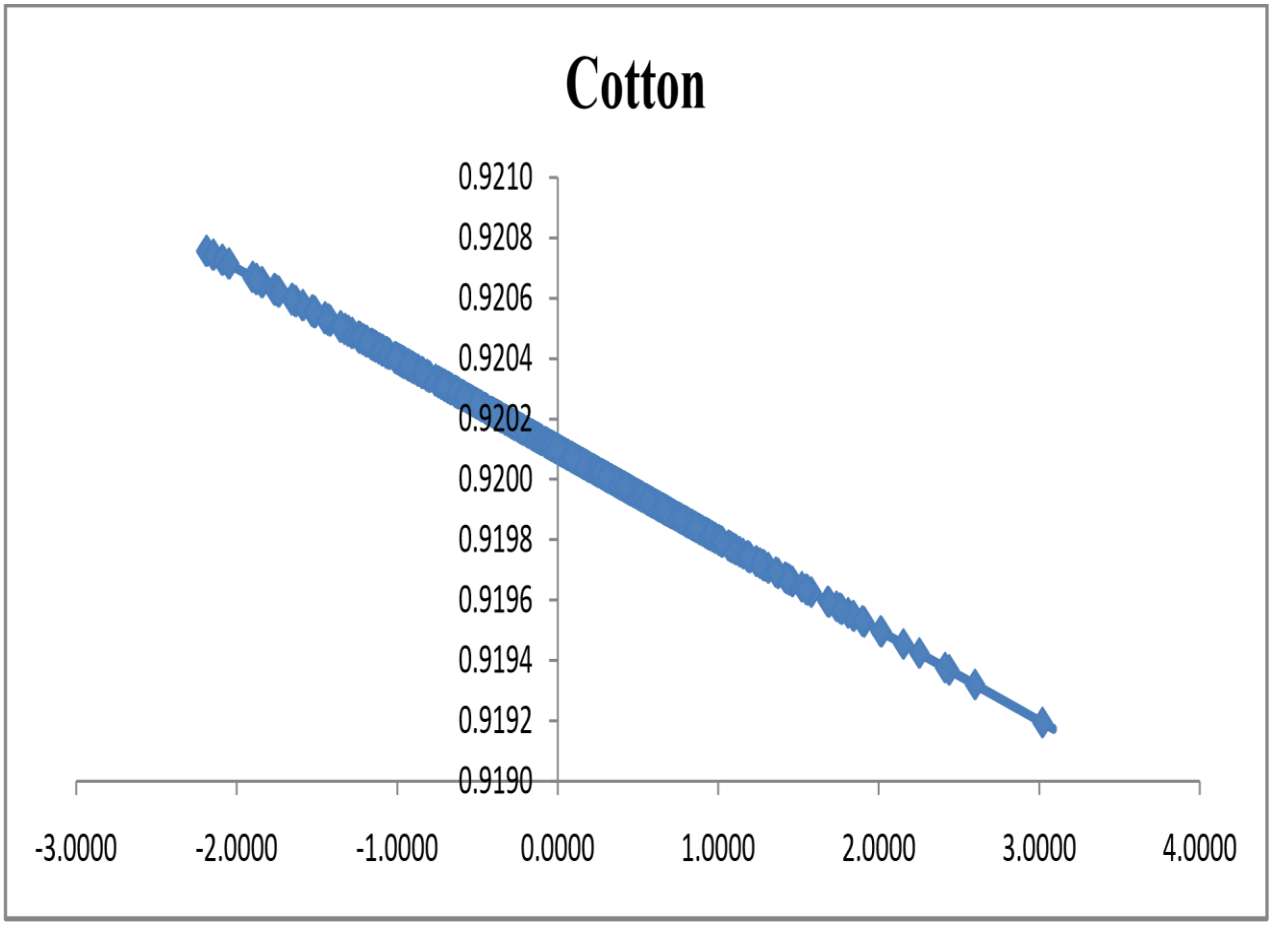
Source: Data obtained from expected return calculation

Interpretation

In the Chart 4.8, a scatter plot with regression line has been depicted for the commodity Coriander. With the help of regression output the corianders expected return is plotted against the returns of commodity index DHAANYA, thereby providing a straight line plot.

Chart 4.9 Chart showing regression between expected return of Cotton and return of

DHAANYA

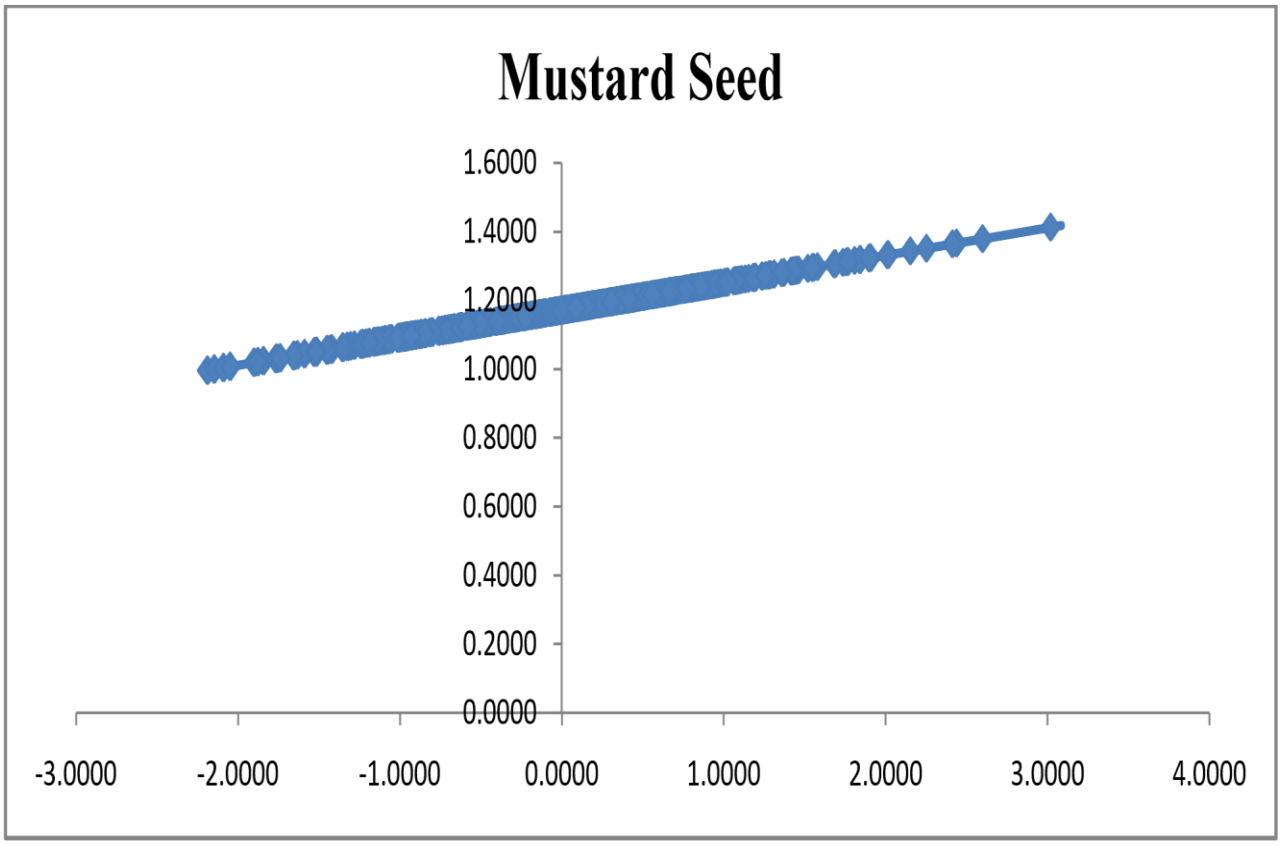


Source: Data obtained from expected return calculation

Interpretation

In the Chart 4.8, a scatter plot with regression line has been depicted for the commodity Cotton. With the help of regression output the cotton's expected return is plotted against the returns of commodity index DHAANYA, thereby providing a straight line plot.

Chart 4.10 Chart showing regression between expected return of Mustard seed and return of DHAANYA

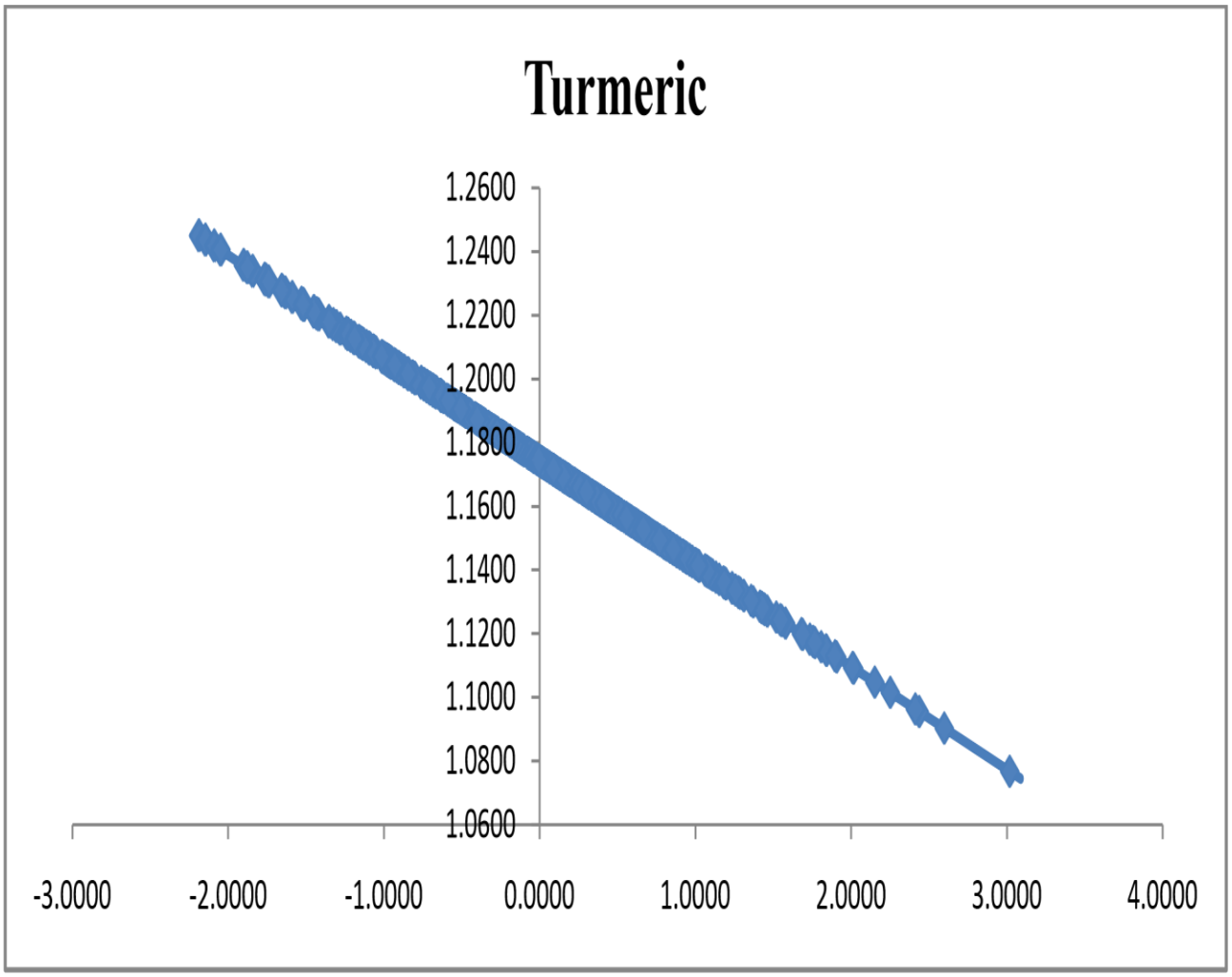


Source: Data obtained from expected return calculation

Interpretation

In the Chart 4.7, a scatter plot with regression line has been depicted for the commodity Mustard seed. With the help of regression output the mustard seed's expected return is plotted against the returns of commodity index DHAANYA, thereby providing a straight line plot.

Chart 4.11 Chart showing regression between expected return of Turmeric and return of DHAANYA



Source: Data obtained from expected return calculation

Interpretation

In the Chart 4.7, a scatter plot with regression line has been depicted for the commodity Turmeric. With the help of regression output the turmeric's expected return is plotted against the returns of commodity index DHAANYA, thereby providing a straight line plot.

4.5. SYSTEMATIC RISK

Table 4.3 Table showing systematic risk

Sl No	Dependent Variable	Explanatory Variable	Beta(β)
1	Barley	DHAANYA	0.0378
2	Coriander	DHAANYA	0.1396
3	Cotton	DHAANYA	-0.0001
4	Mustard Seed	DHAANYA	0.0811
5	Turmeric	DHAANYA	-0.0332

Source: Data obtained from regression calculation

Interpretation

As clearly visible from the data obtained through the calculations, each beta value is lower than 1. Comparatively the coriander's beta is maximum resulting at 0.1396. Also, there is a null beta value obtained for Cotton. Considering the beta values obtained for all the selected commodities, there is an indication that commodity index DHAANYA shows more volatility as compared to each commodity. And it is only for Cotton and Turmeric, which are negatively correlated with index price movement that the beta values obtained are negative. Systematic risk is a part of the total risk. Mainly the factors which are beyond the control of a specific company or organization are categorized under this risk. Even though control measure could be take, it simply cannot be diversified just by investing in an increased number of securities.

4.6. T TEST

Table 4.4 Table showing t test decision

Sl No	Dependent Variable	Explanatory Variable	t Stat	P value*	Decision
1	Barley	DHAANYA	0.7741	0.4391	Don‟t Reject H_0
2	Coriander	DHAANYA	2.1258	0.0339	Reject H_0
3	Cotton	DHAANYA	-0.0070	0.9944	Don‟t reject H_0
4	Mustard Seed	DHAANYA	1.3794	0.1782	Don‟t reject H_0
5	Turmeric	DHAANYA	-0.6790	0.4973	Don‟t Reject H_0

Source: Data obtained from regression calculation

*Note: Level of significance is 0.05%

Interpretation

Calculated critical value is represented by t Stat and P value represents the probability. If level of significance is less than P value then do not reject the null hypothesis. Reject if vice versa. As the calculated P:value for Coriander is less the null hypothesis has been rejected that is it shows that there is significant impact of price movement index on the prices of coriander and for the remaining commodities the null hypothesis is not rejected which there is no significant impact of price variations of index on price variations of commodities.

4.7. ANOVA

Table 4.5 Table showing ANOVA results

Returns	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	887.593	5	177.519	1.84E+03	0
Within Groups	413.067	4290	0.096		
Total	1300.66	4295			

Source: Data obtained from ANOVA calculation

Interpretation

Table number 4.5 shows the ANOVA results for the return values of the index and commodities. Calculated value 0.00 is less than level of significance "0.05". Hence Null-hypothesis H_0 is rejected at 5% level of significance which implies that there is significant difference in the performance of selected commodities in NCDEX. The performance of NCDEX prevails.

The restricted investigation of fluctuation (ANOVA) is utilized to decide if there are any factually noteworthy contrasts between the methods for at least three free (irrelevant) gatherings. This guide will give a short prologue to the restricted ANOVA, including the suppositions of the test and when you should utilize this test.

On the off chance that you know about the restricted ANOVA, you can skirt this guide and go straight to how to run this test in SPSS Statistics by clicking here. The restricted ANOVA looks at the methods between the gatherings you are keen on and decides if any of those methods are measurably essentially not the same as each other.

CHAPTER 5

FINDINGS AND CONCLUSION

5.1. FINDINGS

- In the considered period of study, a consistent rise for Index DHAANYA is observed.
- On the basis of data collected, the fluctuation in the prices of selected commodities clearly point that Coriander resulted as one with maximum volatility in price. Within a duration of an year, near to ₹6000 change was observed.
- Based on the values of average return Barely produced the maximum return in comparison with remaining commodities. Equal returns were resulted for turmeric and mustard seeds.
- While determining the nature of relationship as well as comparing the degree co-relation among all commodities against the index, we clearly found there exists a positive co-relation of low degree between commodity index and all the commodities.
- The price variation of commodity when compared against the index price movement show considerably low significance to the variation.
- For the commodity coriander return explainable by index is just 0.63%.
- For the commodity mustard seed return explainable by index is just 0.27%.
- On the basis of value of beta calculated, we can infer that volatility for commodity returns is lesser than that of returns of index.
- With a significance value of 0.0339 only coriander has a considerable level of significance under the T test hypothesis. With a p value greater than 0.05 all remaining commodities have insignificant level of significance.
- The significance between the groups is found to be zero through the ANNOVA test results. Hence rejecting the null hypothesis it states that there is significant difference in performance (mean return) of commodities.

5.2. CONCLUSION

This studies main objective is to know the how the prices of selected agricultural commodities fluctuate and whether or not the commodity index prices get affected by this behavior. The end results help to check and infer there is a significant level of independence between the prices of commodities when stacked against the commodity index prices.

As for the results of the T test, there is found to be an impact on the prices of coriander as the fluctuations are observed in the index prices. Whereas the other remaining commodities show least impact when there is a price deviations of index. ANOVA results displays significance value to be zero, and from that it could be inferred that the performance of DHAANYA prevails; there is no significant difference in performance of selected commodities.

5.3 SUGGESTIONS

On the basis of the study conducted on the selected set of data there are certain suggestions which could be undertaken. On the basis of the calculated values of average return Barely produced the maximum yield in comparison with remaining commodities, hence is suggested to be one amongst the safer commodities to trade in the market. Also, as per the observation there were equal returns resulted for turmeric and mustard seeds, the investment decision must be made by comparing the current market price of each commodity.

In the process of determination of the nature of relationship as well as comparing the degree of co-relation among all commodities against the index, we clearly found there exists a positive co-relation of low degree between commodity index and all the commodities. So one must consider that the volatility of commodity index isn't alone the factor determining the commodity prices of the individual commodity futures.

Thus by the results of the analysis it is concluded that the price variation of commodity when compared against the index price movement show considerably low significance to the variation.

BIBLIOGRAPHY

1. Brajesh Kumar and Ajay Pandey. (2013). Market proficiency in Indian ware fates markets. Diary of Indian Business Research. 5(2). p 101-121.
2. C Hussain Yaganti and B Kamaiah. (2012). Supporting Efficiency of Commodity Futures Markets in India. IUP Journal of Financial Risk Management. 9(2). p 40-58.
3. Delphine Lautier. (2005). Term Structure Models of Commodity Prices. The Journal of Elective Investments. 8(1). p 42-64.
4. G Naresh, S Thiyagaranjan and S Mahalaxmi. (2015). Value Gouging of Futures on Ware Indices in India. IUP Journal of Financial Risk Management. 12(2). p 7-17.
5. G R Sayee Prasanna. (2014). Execution Evaluation of Agricultural Commodity Futures Market in India. IUP Journal of Applied Finance. 20(1). p 34-45.
6. G Vasantha and T Mallikarjunappa. (2015). Lead-Lag Relationship and Price Discovery in Indian Commodity Derivatives and Spot Market: An Example of Pepper. IUP Journal of Applied Finance. 21(1). p 71-83.
7. Giorgio Canarella and Stephen K Pollard. (1985). Productivity of Commodity Futures. The Diary of Futures Markets (pre-1986). 5(1). p 57.
8. Hans R. Stoll and Robert E. Whaley. (2010). Ware Index Investing and Commodity Prospects Prices. Diary of Applied Science. 20(1). p 7.
9. Jabir Ali and Kriti Bardhan Gupta. (2011). Proficiency in rural ware prospects advertises in India. Farming Finance Review. 71(2). p 171-178.
10. Meenakshi Malhotra and Dinesh Kumar Sharma. (2015). Effect of prospects exchanging on instability of spot showcase an instance of guar seed Agricultural Finance Review. 75(3). p 413-417.
11. Neil Kellard, Paul Newbold, Christine Ennew, and Tony Rayner. (2013) The relative effectiveness of product fates markets. The Journal of Futures Markets. 19(4). p 413.Prabhati
12. Pratap Chandra Pati and Purna Chandra Padhan. (2009). Data, Price Discovery and Causality in the Indian Stock Index Futures Market. IUP Journal of Financial Risk Management. 6.3(4). p 7-21.

13. Prof. (Dr.) J. K. Das and Gourab Chakraborty. (2015). The Hedging Performance of Commodity Futures in India. Worldwide Journal of Information, Business and Management.7(3). p 172-190.
14. R Chakrabarty and Rahuldeb. (2010). Impact of Futures Trading on the Volatility of Spot Market in the Context of Indian Agricultural Commodity Market. GITAM
Survey of International Business. 3(1). p 41.
15. Ranjit Chakrabarty and Asima Sarkar. (2010). Effectiveness of the Indian Commodity and Stock Market with Focus on some Agricultural Product. Worldview. 14(1). p 85-96.
16. Ranjit Chakraborty and Rahuldeb Das. (2013). Dynamic Relationship between Futures Trading and Spot Price Volatility. IUP Journal of Applied Finance. 19(4). p 5-19.
17. Shaik Masood and T Satyanarayana Chary. (2015). Value Discovery and Market Efficiency of Commodities Futures Market in India. Global Journal of Financial Management. 5(2). p 87.
18. Sheeba Kapil and Kanwal Nayan Kapil. (2010). Item exchanging counselors (CTAs) for the
Indian item advertise. Global Journal of Emerging Markets. 5(2). p 124-137.
19. Stephen J Turnovsky. (1983). The Determination of Spot and Futures Prices with Storable Products. Econometrica. 51(5). p 1363.
20. Terrance Grieb. (2012). Mean and unpredictability transmission for item fates. Diary of Financial matters and Finance. 39(1). p 100.

21. Wasim Ahmad and Sanjay Sehgal. (2015). The examination of destabilization impact in India‟s agribusiness item fates advertise. Diary of Financial Economic Policy. 7(2). p 139.
22. Daniele Girardi. (2012). Do money related financial specialists influence the cost of wheat? PSL QuarterlyAudit. 65(260) p 79.
23. Thiagu Ranganathan and Usha Ananthakumar. (2014). Market productivity in Indian Soybean fates markets. Worldwide diary of developing markets. 9(4). p520
24. Prof. Ranjit Chakraborty and Rahuldeb Das. (2015). Elements Influencing Commodity Futures Prices in India:A Polynomial Distributed Lag Model. Diary of Contemporary Research in Management. 10(2). p33.
25. Wasim Ahmad and Sanjay Sehgal. (2015). The examination of destabilization impact in

India‟s farming item fates advertise. Diary of Financial Economic Policy. 7(2). p 139.

26. Tarun Kumar Soni. (2014). Cointegration, direct and nonlinear causality: Analysis utilizing Indian horticulture prospects contracts. Diary of Agribusiness in Developing and Emerging Economies. 4(2). p157.

27. Dr. C S Basavraj and Dr. G Prahlad Chowdri. (2013). Value Discovery in Indian Commodity Market, A Study on Red Chilly. Sumedha Journal of Management. 2(3). p151

28. Prabhati Kumari Misra and Kishor Goswami. (2015). Consistency of sugar fates: Evidence from the Indian item advertise. Farming Finance Review. 75(4). p552.

29. C Hussain Yaganti and B Kamaiah. (2012). Supporting Efficiency of Commodity Futures Markets in India. The IUP Journal of Financial Risk Management 9(2) p 40.

30. Barry Strydom and Kerry Mccullough. (2013). Value disclosure in White maize fates advertise. Diary of Business Management. 7(26) p 2603.

31. Martin T. Bohl and Patrick M. Stephan. (2013). Does Futures Speculation Destabilize Spot Prices? New Evidence for Commodity Markets. Diary of Agricultural and Applied Economics. 45(4). p 596.

32. J N Dhankhar. (2009). Future Market in Indian Agriculture and its Impact on Production and Costs. Indian Journal of Agricultural Economics. 64(3). p 521.

33. Prabhati Kumari misra and Kishor goswami. (2015). Consistency of sugar prospects: prove from the Indian ware advertise. Agrarian Finance Review. 75(4). p 36-45.

34. Sheeba Kapil and Kanwal Nayan Kapil. (2010). Item exchanging guides (CTAs) for the Indian item showcase. Global Journal of Emerging Markets. 5(2). p 124-137.Kumari Misra & Kishor Goswami. (2015). Predictability of sugar futures: evidence from the Indian commodity market. *Agricultural Finance Review*. 75(4). p 36-45.

Webilography

1. Proquest (2017) Available at: http://search.proquest.com/results/81CE4C98 DD4444 6FPQ/1accountid=59525 (Accessed: 26th October 2017).

2. Wikipedia (2017) Available at : https://en.wikipedia.org/wiki/Commodity_market (Accessed: 1st February 2017)
3. NCDEX (2017) Available at: http://www.ncdex.com/MarketDataAction_liveSpotQuotesList

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Title of the project :A Study on volatility of selected Indian agricultural commodity prices.

WEEK	WORK UNDERTAKEN	EXTERNAL GUIDE SIGN	INTERNAL GUIDE SIGN
15-1-2018 to 20-1-2018	Introduction about Pattern effects labs and its operation	Harshita	
22-1-2018 to 27-1-2018	Learning about different operation and products	Harshita	
29-1-2018 to 3-2-2018	Orientation and Gathering information about growth of company	Harshita	
5-2-2018 to 10-2-2018	Analysis of market position of the company	Harshita	
12-2-2018 to 17-2-2018	Research problem identification	Harshita	
19-2-2018 to 24-2-2018	Preparation of research instruments for the data collection	Harshita	
26-2-2018 to 3-3-2018	Theoretical background of the study	Harshita	
5-3-2018 to 10-3-2018	Data collection and data analysis	Harshita	
12-3-2018 to 17-3-2018	Interpretation of the data gathered during the survey	Harshita	
19-3-2018 to 24-3-2018	Final report preparation and submission	Harshita	

Internal Guide:

HOD: