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- Use (**ed.**) for one editor, and (**ed.s**) for multiple editors.
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- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio," Ohio State University.

Contributions to books
- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

Journal and other articles
- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

Conference papers
- Chandel K.S. (2009): "Ethics in Commerce Education." Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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- Kumar S. (2006): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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Website
- Kelkar V. (2009): Towards a New Natural Gas Policy, Economic and Political Weekly, Viewed on February 17, 2011 http://epw.in/epw/user/viewabstract.jsp

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FUNDAMENTAL & TECHNICAL ANALYSIS OF REAL ESTATE SECTOR: AN INDIAN PERSPECTIVE

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ASST. PROFESSOR

LOVELY PROFESSIONAL UNIVERSITY

PHUGWARA

ABSTRACT

Real Estate sector is one of the attractive businesses in the today's business scenario so it becomes important to study the prospect of real estate firm. In this report first of all factor analysis has been done to find out which all factors are responsible for change in the share prices of DLF. The variables which has been taken for analysis includes IIP, WPI, FII, crude oil, RSVD, property prices and CRR. In total 103 observations have been taken into account from June 1ˢᵗ 2008 to March 2009. At last two factors have been identified First factor containing IIP, WPI, Crude oil, property prices and CRR whereas second factor contains FIIs and RSVD. Next the regression equation is found out as DLF share price-= 3.67 − 16 + 0.838 factor1 + 0.229 factor 2, CAGR of about 24% real estate sector future is very promising moreover the organized sector of the business is already untouched requiring more and more initiatives to be taken.

KEYWORDS

OHLC Chart, MACD, Trend Line, Stochastic oscillator

REAL ESTATE SECTOR IN INDIA

The real estate sector in India is of great importance. According to the report of the Technical Group on Estimation of Housing Shortage, an estimated shortage of 26.53 million houses during the Eleventh Five Year Plan (2007-12) provides a big investment opportunity. The Indian real estate industry is expected to touch US\$ 50 billion by 2010.

Real estate accounts for approximately five per cent of the GDP and this share is expected to increase to six per cent in the next five years. Growth has been driven primarily by the IT/ITeSsector with an increase in the demand for office space, growing presence of foreign businesses in India, the global strides of Indian corporatesand a rapidly increasing consumer class. The real estate sector is in its early growth stage and can be segmented into residential, commercial, retail and hospitality asset classes

Real Estate development is taking place in Residential, Retail, Office, Hotels, and Warehousing and Industrial sectors. The key drivers of each of these property types are basic fundamentals. The IT/BPO sector is expected to generate 1000Mn sft of demand for office space over the next five years. The rising middle class and its consumer demand is driving the retail boom. The large shortage in the housing sector will continue to fuel the growth in the residential market. The real demand is not in the high end residential market but in the affordable housing segment and this will be the driver for the residential market.

Moving forward Real Estate finance will also see growth in all areas of Public and Private: Debt and Equity. In the private equity space the market is currently governed by the high net worth individuals, PE funds and closed ended funds, mutual funds. Banks and NBFC's are the only players operating in the debt market. Quasi-public agencies and mezzanine funds will be the next movers into this sector. As the market grows, the private debt operators will move towards public equity. We have already started witnessing this in the form of IPO's by developers. REITs and mutual funds will make it easier for individual investors to invest in Real Estate and further make the risk more diversifiable for the market as a whole. There is no public debt market in India.

Overall, with further growth in the sector, career opportunities are only getting better. There are many ways to participate in this growth - public equity, private equity, debt development, investment, sales, research, leasing, property services, entrepreneurial ventures, public policy, govt. agencies, planning, architecture/engineering, investment banking etc.

The main challenges in the future also offer opportunities as they require solutions in various forms. Urban planning is the single biggest challenge for our cities. It is imperative that our urban infrastructure keeps pace with our economic growth. Better roads will help bring down the supply demand gap of land in future. Good roads will help increase supply of land and bring down property prices. Land acquisition reforms also offer many challenges. Astronomical government stamp duty rates increase property transfer costs and high costs come in the way of securitized debt market and efficient mortgage markets.

FUNDAMENTAL & TECHNICAL ANALYSIS

INTRODUCTION

The objective of this segment is to find out that which are the factors that affect the share prices the most and find out regression equation for the factors which has a considerable affect on the share prices. For this daily share price has been taken for a certain period and the factors which has been taken for the analysis are Index of Industrial Production (IIP), Foreign Institutional Investors (FIIs), Rupee vs. Dollar (RSVD), Wholesale Price Index (WPI), Crude Oil and Cash Reserve Ratio.

TECHNICAL ANALYIS

Technical analysis is based almost entirely on the analysis of price and volume. The fields which define a security's price and volume are explained below.

OPEN - This is the price of the first trade for the period (e.g., the first trade of the day). When analyzing daily data, the Open is especially important as it is the consensus price after all interested parties were able to "sleep on it."

HIGH - This is the highest price that the security traded during the period. It is the point at which there were more sellers than buyers (i.e., there are always sellers willing to sell at higher prices, but the High represents the highest price buyers were willing to pay).

LOW - This is the lowest price that the security traded during the period. It is the point at which there were more buyers than sellers (i.e., there are always buyers willing to buy at lower prices, but the Low represents the lowest price sellers were willing to accept).

CLOSE - This is the last price that the security traded during the period. Due to its availability, the Close is the most often used price for analysis. The relationship between the Open (the first price) and the Close (the last price) are considered significant by most technicians. This relationship is emphasized in candlestick charts.

VOLUME - This is the number of shares (or contracts) that were traded during the period. The relationship between prices and volume (e.g., increasing prices accompanied with increasing volume) is important.

OHLC CHART - The very first tool which is being used is the OHLC (open-high-low-close) chart which is used to analyze the volumes of shares being traded at various prices for the period (**See** table 2.2(a) & Table 2.2 (b) OHLC Chart and trend line of DLF)

The chart depicts the black and white candlesticks. Candlesticks charts dramatically illustrate changes in underlying supply/demand lines.

Because candlesticks display the relationship between the open, high, low, and closing prices, they cannot be displayed on securities that only have closing prices, nor were they intended to be displayed on securities that lack opening prices. If we want to display a candlestick chart on a security that does not have opening prices, it is suggested to use the previous day's closing prices in place of opening prices. This technique can create candlestick lines and patterns that are unusual, but valid.

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Interpretation of candlesticks is primarily based on patterns. Some of the most popular patterns are explained as below:

BULLISH PATTERNS
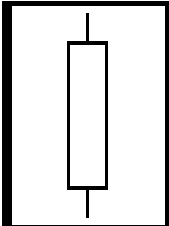
Long white (empty) line. This is a bullish line. It occurs when prices open near the low and close significantly higher near the period's high.
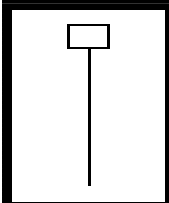
Hammer. This is a bullish line if it occurs after a significant downtrend. If the line occurs after a significant up-trend, it is called a Hanging Man. A Hammer is identified by a small real body (i.e., a small range between the open and closing prices) and a long lower shadow (i.e., the low is significantly lower than the open, high, and close). The body can be empty or filled-in.
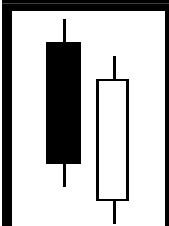
Piercing line. This is a bullish pattern and the opposite of a dark cloud cover. The first line is a long black line and the second line is a long white line. The second line opens lower than the first line's low, but it closes more than halfway above the first line's real body.
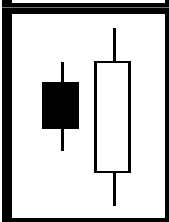
Bullish engulfing lines. This pattern is strongly bullish if it occurs after a significant downtrend (i.e., it acts as a reversal pattern). It occurs when a small bearish (filled-in) line is engulfed by a large bullish (empty) line.
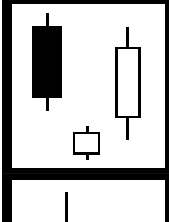
Morning star. This is a bullish pattern signifying a potential bottom. The "star" indicates a possible reversal and the bullish (empty) line confirms this. The star can be empty or filled-in
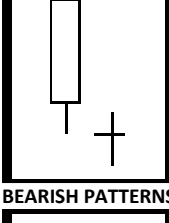
Bullish doji star. A "star" indicates a reversal and a doji indicates indecision. Thus, this pattern usually indicates a reversal following an indecisive period. You should wait for a confirmation (e.g., as in the morning star, above) before trading a doji star. The first line can be empty or filled in.

BEARISH PATTERNS
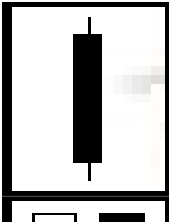
Long black (filled-in) line. This is a bearish line. It occurs when prices open near the high and close significantly lower near the period's low.
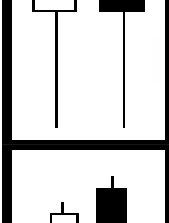
Hanging Man. These lines are bearish if they occur after a significant uptrend. If this pattern occurs after a significant downtrend, it is called a Hammer. They are identified by small real bodies (i.e., a small range between the open and closing prices) and a long lower shadow (i.e., the low was significantly lower than the open, high, and close). The bodies can be empty or filled-in.
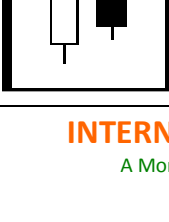
Dark cloud cover. This is a bearish pattern. The pattern is more significant if the second line's body is below the center of the previous line's body (as illustrated).

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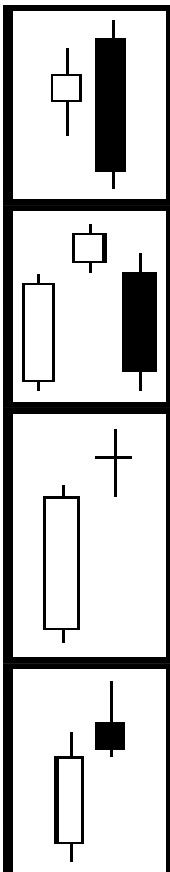
Bearish engulfing lines. This pattern is strongly bearish if it occurs after a significant up-trend (i.e., it acts as a reversal pattern). It occurs when a small bullish (empty) line is engulfed by a large bearish (filled-in) line.

Evening star. This is a bearish pattern signifying a potential top. The "star" indicates a possible reversal and the bearish (filled-in) line confirms this. The star can be empty or filled-in.

Doji star. A star indicates a reversal and a doji indicates indecision. Thus, this pattern usually indicates a reversal following an indecisive period. You should wait for a confirmation (e.g., as in the evening star illustration) before trading a doji star.

Shooting star. This pattern suggests a minor reversal when it appears after a rally. The star's body must appear near the low price and the line should have a long upper shadow

REVERSAL PATTERNS
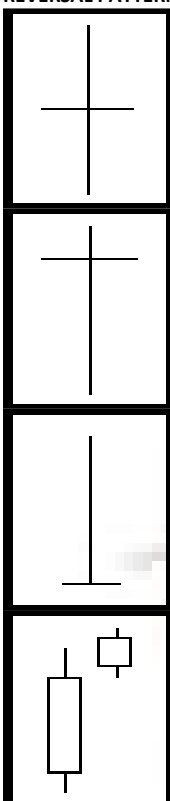
Long-legged doji. This line often signifies a turning point. It occurs when the open and close are the same, and the range between the high and low is relatively large.

Dragon-fly doji. This line also signifies a turning point. It occurs when the open and close are the same, and the low is significantly lower than the open, high, and closing prices.

Gravestone doji. This line also signifies a turning point. It occurs when the open, close, and low are the same, and the high is significantly higher than the open, low, and closing prices.

Star. Stars indicate reversals. A star is a line with a small real body that occurs after a line with a much larger real body, where the real bodies do not overlap. The shadows may overlap.
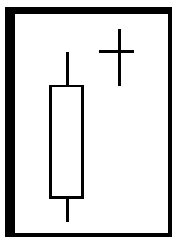
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Doji star. A star indicates a reversal and a doji indicates indecision. Thus, this pattern usually indicates a reversal following an indecisive period. You should wait for a confirmation (e.g., as in the evening star illustration) before trading a doji star.

NEUTRAL PATTERNS
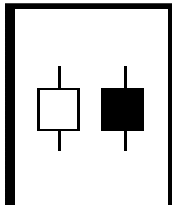
Spinning tops. These are neutral lines. They occur when the distance between the high and low, and the distance between the open and close, are relatively small.
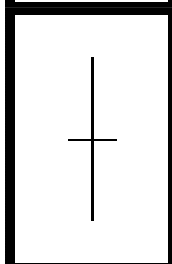
Doji. This line implies indecision. The security opened and closed at the same price. These lines can appear in several different patterns. Double doji lines (two adjacent doji lines) imply that a forceful move will follow a breakout from the current indecision.

So above mentioned where some of the patterns of candlesticks which can be definitely observed in OHLC chart

SUPPORT AND RESISTENCE

Think of security prices as the result of a head-to-head battle between a bull (the buyer) and a bear (the seller). The bulls push prices higher and the bears push prices lower. The direction prices actually move reveals who is winning the battle. The bulls in race of pushing the price higher don't allow the shares of the firm to fall below certain price level which is termed as **support.** Similarly bears in race to push price further lower don't allow the price to move up below certain price level which is termed as **resistance. (See** table 2.3 Support & Resistance line)

MACD INDICATOR

An indicator is a mathematical calculation that can be applied to a security's price and/or volume fields. The result is a value that is used to anticipate future changes in prices. A moving average fits this definition of an indicator: it is a calculation that can be performed on a security's price to yield a value that can be used to anticipate future changes in prices.

The MACD is calculated by subtracting a 26-day moving average of a security's price from a 12-day moving average of its price. The result is an indicator that oscillates above and below zero.

When the MACD is above zero, it means the 12-day moving average is higher than the 26-day moving average. This is bullish as it shows that current expectations (i.e., the 12-day moving average) are more bullish than previous expectations (i.e., the 26-day average). This implies a bullish, or upward, shift in the supply/demand lines. When the MACD falls below zero, it means that the 12-day moving average is less than the 26-day moving average, implying a bearish shift in the supply/demand lines. (**See** table 2.4(a) & table 2.4(b) MACD indicator)

STOCHASTIC OSCILLATOR

Sto.chas.tic (sto kas'tik) - Designating a process having an infinite progression of jointly distributed random variables. The Stochastic Oscillator compares where a security's price closed relative to its price range over a given time period.

The Stochastic Oscillator is displayed as two lines. The main line is called "%K." The second line, called "%D," is a moving average of %K. The %K line is usually displayed as a solid line and the %D line is usually displayed as a dotted line.

There are several ways to interpret a Stochastic Oscillator. Three popular methods include:

1. Buy when the Oscillator (either %K or %D) falls below a specific level (e.g., 20) and then rises above that level. Sell when the Oscillator rises above a specific level (e.g., 80) and then falls below that level
2. Buy when the %K line rises above the %D line and sell when the %K line falls below the % D line.

Calculation

The Stochastic Oscillator has four variables:

1. **%K Periods.**
    This is the number of time periods used in the stochastic calculation.
2. **%K Slowing Periods.**
    This value controls the internal smoothing of %K. A value of 1 is considered a fast stochastic; a value of 3 is considered a slow stochastic.
3. **%D Periods.**
    This is the number of time periods used when calculating a moving average of %K. The moving average is called "%D" and is usually displayed as a dotted line on top of %K.
4. **%D Method.**
    The method (i.e., Exponential, Simple, Time Series, Triangular, Variable, or Weighted) that is used to calculate %D.
5. The formula for %K is:

$$\left(\frac{Today's\ Close\ -\ Lowest\ Low\ in\ \%K\ Periods}{Highest\ High\ in\ \%K\ Periods\ -\ Lowest\ Low\ in\ \%K\ Periods} \right) * 100$$

In our calculation of % K and %D we have taken % K periods as 5 days with %K slowing period as 1 day and %D periods as 5days. If you use a value greater than one, you average the highest-high and the lowest-low over the number of %K Slowing Periods before performing the division. A moving average of %K is then calculated using the number of time periods specified in the %D Periods. This moving average is called %D.

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The Stochastic Oscillator always ranges between 0% and 100%. A reading of 0% shows that the security's close was the lowest price that the security has traded during the preceding x-time periods. A reading of 100% shows that the security's close was the highest price that the security has traded during the preceding x-time periods.

LEADING AND LAGGING INDICATORS

Another class of indicators are "leading" indicators. These indicators help you profit by predicting what prices will do next. Leading indicators provide greater rewards at the expense of increased risk. They perform best in sideways, "trading" markets.

Moving averages and the MACD are examples of trend following, or "lagging," indicators. These indicators are superb when prices move in relatively long trends. They don't warn you of upcoming changes in prices, they simply tell you what prices are doing (i.e., rising or falling) so that you can invest accordingly. Trend following indicators have you buy and sell late and, in exchange for missing the early opportunities, they greatly reduce your risk by keeping you on the right side of the market. In the above figure I have shown the overbought and oversold by the arrows. Leading indicators typically work by measuring how "overbought" or "oversold" a security is. This is done with the assumption that a security that is "oversold" will bounce back (**See** table 2.5 (a) stochastic oscillator and table 2.5 (b & c) with leading & lagging indicators against closing price of the share in reference i.e. DLF)

LITERATURE REVIEW

A number of empirical studies (e.g. Quan, Daniel C and Sheridan Titman, 1998; Eichholtz, Piet, Hartzell, David J., 1996"; Barry, Christopher-B., Mauricio Roderiguez and Joseph B.Lipscomb , 1996,) has already been done to find out the relationship between the Real Estate Prices and Stock Prices, Property Shares, Appraisals and the Stock Market and also the factors affecting the share & real estate prices in any country which mainly are IIP, FII, foreign exchange rate, WPI, CRR etc.

Many authors have tested substantial amount of the correlation across world property markets to the effects of changes in IIP, suggesting that real estate is a bet on fundamental economic variables which are correlated across countries. Relationship between changes in IIP and international property returns suggests that the cross-border correlations of real estate are due in part to common exposure to fluctuations in the global economy, as measured by an equal-weighted index of international IIP changes. Real estate is fundamentally local, demand for space apparently responds to contemporaneous changes in the global economy.

Also it has been argued that commercial real estate offers diversification benefits to institutional investors because of its low correlation with commonly used stock price indexes. The low correlation between real estate and stock price indexes is somewhat surprising, given that both are affected by the level of economic activity and interest rates. However, other factors can reduce the correlation between the two time series. Real estate will indeed provide substantial diversification benefits for pension funds and other institutions if the low correlations between real estate and stock price indexes arise because the values of these capital assets react very differently to economic factors.

Also authors have tried to find the relationship between common stock and appraisal-based returns which property share returns exhibit. Property share returns also predict appraisal-based indices. Property returns as calculated on the basis of valuations consistently show serial correlation where returns or simply price movements in one period are correlated with returns in previous periods.

METODOLOGIES

FOREIGN INSTITUTIONAL INVESTORS

INDEX OF INDUSTRIAL PRODUCTION

Index of industrial production is an abstract number, the magnitude of which symbolizes the status of production in the industrial sector for a given period of time as compared to the reference period of time. In the case of India the base year has been fixed at 1993-94 hence the same would be equivalent to 100 points.

METHOD OF CALCULATION

The index is computed using the weighted arithmetic mean of the quantity relatives with the weights being allotted to the various items in proportion to the values added by the manufacturer in the base year by using **laspeyre's** formula:

$$I= \sum (W_iR_i)/\sum W_i$$ Where I is the Index,

Ri is the production relative of the Ith term for the month

Wi is the weight allotted to it.

It is the bench mark for depicting the growth of the Indian economy vis-à-vis manufacturing, mining and electricity sector industries. Which measures the health of the macroeconomic by giving an indication regarding which section of the Indian industry has performed well?

Strong IIP numbers acts as a catalyst for upward movement of market whereas if they are not very exciting then it acts as a hurdle for market.

FOREIGN INSTITUTIONAL INVESTORS

FII's is to denote an investor – mostly of the form of an institution or entity, which invest money in the financial market of a country different from the one where is the institution or the entity was originally incorporated.

It is frequently referred as hot money for the reason it can leave the country at the same speed at which it comes. The Indian Stock market is sometimes considered as a gamble of FIIs as their movement many a times decides the movement of Sensex. Thus this variable has been taken for study to know its impact on the Sensex.

EXCHANGE RATE

The exchange rate is the price at which the currency of one country can be converted to the currency of another. Here the rupee dollar exchange rate has been taken for this study as fluctuation in exchange rates affects the profitability of companies and Sensex. The appreciation in rupee impacts the export oriented sectors negatively whereas an appreciation act as trigger for them.

WHOLESALE PRICE INDEX

A Wholesale Price Index (WPI) is the price of a representative basket of wholesale goods. The items included in WPI are fertilizers, minerals, industrial raw materials and semi-finished goods, machinery and equipment, fuel, light and power.

It is the only general index capturing the price movements in a comprehensive way.

CRUDE OIL

Crude oil finds its application almost in all of the industries and economy as a whole. So the movement in its price is obvious to create an effect on the sensex. When crude prices moved, the rest of the financial markets reacted. A jump in crude oil prices meant a nasty day for the stock markets. And a drop in crude almost invariably brought a relief rally in stocks. Conventional wisdom explained this phenomenon as an economic one. Since our economy is oil-based, more expensive oil means a more expensive cost basis for almost everything else. (The economy is oil-based, in that oil and natural gas are the energy sources for most processes, including transportation and electricity. Petroleum is a raw material for many chemical products as well.)An equally plausible explanation (especially for short-term swings) is that the stock market's reactions to oil price movements are fear-based. Increasing oil prices - especially beyond historical ranges could signal structural changes in the international economic landscape. This uncertainty caused markets to worry about every additional move up in oil prices, and breathe a sigh of relief with every drop.

CASH RESERVE RATIO

It is the amount that every bank is required to keep with the central bank i.e. RBI. It is the percentage of the total reserves with the bank that the bank is required to keep with RBI.

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DATA
ANALYSIS OF THE DATA
TIME PERIOD OF DATA
The data has been collected for a period starting from June 2008 to March 2009 on daily basis. The independent variables for this include Index of Industrial Production (IIP), Prime Lending Rates (PLR), Wholesale Price Index, Foreign Institutional Investors, and Currency Fluctuations, Crude Oil prices. The total number of observations for each of these variables includes 103(days).

DATA ANALYSIS
The descriptive statics like Sample size, mean, minimum, maximum, standard deviation, variance, range, etc has been found for the data sets. The details of the descriptive statistics have been given below.

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std.	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
DLFSP	103	409.00	554.00	963.00	733.2524	140.56509	.248	.238
IIPR	103	66.20	280.50	346.70	315.4981	23.52836	-.214	.238
FIIS	103	258.00	571.00	829.00	693.1359	70.11714	.084	.238
MFS	103	1524.70	310.80	1835.50	739.6466	346.40712	.939	.238
RSVSD	103	3.00	37.00	40.00	38.6602	.86945	-.005	.238
WPIS	103	10.60	215.90	226.50	219.1558	2.79434	1.292	.238
PROPERTY	103	330.00	3840.00	4170.00	4024.3689	134.86689	-.366	.238
CRUDEOIL	103	15.10	87.80	102.90	96.7379	4.86641	-.477	.238
CRRS	103	.50	6.75	7.25	7.0121	.10721	.286	.238
Valid N (listwise)	103							

FACTOR ANALYSIS
In this section factor analysis will be used and factors will be found out which affects the DLF's share prices the most.

Correlation Matrix

		IIP	FII	RS V/S D	WPI	PROPERTY PRICE	CRUDE	CRR
Correlatio	IIP	1.000	.115	.326	.857	.957	.954	.602
	FII	.115	1.000	.128	.086	.091	.103	-.004
	RS V/S D	.326	.128	1.000	.363	.340	.233	.176
	WPI	.857	.086	.363	1.000	.780	.811	.790
	PROPERTY PR	.957	.091	.340	.780	1.000	.935	.515
	CRUDE	.954	.103	.233	.811	.935	1.000	.598
	CRR	.602	-.004	.176	.790	.515	.598	1.000

The above table shows what correlation does each factor has with the other factors whether it is highly correlated or is not correlated or whether there is positive or negative correlation. From the above table we can conclude that IIP and Property Price are highly positively correlated whereas CRR and FII are negatively low correlated and have almost no correlation.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.806
Bartlett's Test of Sphericity	Approx. Chi-Square	769.936
	df	21
	Sig.	.000

KMO and Bartlett's Test is utilized to see whether factor analysis can be applied to the factors in the question or not. It also shows to what extent factors will be formed effectively. For the factor analysis to be used the value of Bartlett should be greater than .5 and the significance level should be < .05. from the above table it is clear that KMO as well as Bartlett's values are well above 0.5 and significance level is .000. so factor analysis will be done.

Communalities

	Initial	Extraction
IIP	1.000	.936
FII	1.000	.773
RS V/S D	1.000	.400
WPI	1.000	.871
PROPERTY PRICE	1.000	.868
CRUDE	1.000	.893
CRR	1.000	.604

Extraction Method: Principal Component Analysis.

Communalities indicate the amount of variance in each variable that is accounted for. Initial communalities are estimates of the variance in each variable accounted for by all components or factors. For principal components analysis, this is always equal to 1.0 (for correlation analyses) or the variance of the variable (for covariance analyses). For other extraction methods, these values are the proportion (for correlation analyses) or the amount (for covariance analyses) of variance accounted for in each variable by the rest of the variables. Extraction communalities are estimates of the variance in each variable accounted for by the factors (or components) in the factor solution. Small values indicate variables that do not fit well with the factor solution, and should possibly be dropped from the analysis. From the above table it is clear that none of the variable except exchange rate have lower value. Exchange rates too has rate which can be taken for consideration so none of the variable is eliminated.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.288	61.263	61.263	4.288	61.263	61.263	4.127	58.951	58.951
2	1.057	15.103	76.366	1.057	15.103	76.366	1.219	17.415	76.366
3	.835	11.922	88.288						
4	.620	8.863	97.151						
5	.119	1.693	98.844						
6	.053	.753	99.597						
7	.028	.403	100.000						

Extraction Method: Principal Component Analysis.

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This table gives eigenvalues, variance explained, and cumulative variance explained for your factor solution. The first panel gives values based on initial eigenvalues. For the initial solution, there are as many components or factors as there are variables. The "Total" column gives the amount of variance in the observed variables accounted for by each component or factor. The "% of Variance" column gives the percent of variance accounted for by each specific factor or component, relative to the total variance in all the variables. The "Cumulative %" column gives the percent of variance accounted for by all factors or components up to and including the current one. The Extraction Sums of Squared Loadings group gives information regarding the extracted factors or components. For principal components extraction, these values will be the same as those reported under Initial Eigenvalues results of factor rotation can be seen in the "Rotation Sums of Squared Loadings" group. The table above shown that 76% of variance is explained in component two only.
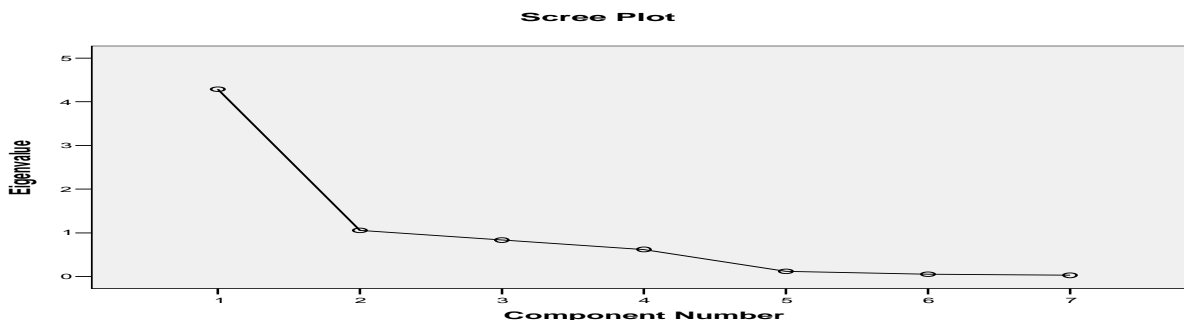
Scree Plot

Scree plot shows no of factors that are required to be formed. The value above or number of points above till the plot is >1 determines no. of factors. In the above case the number of factors is 2.

Rotated Component Matrix[a]

	Component	
	1	2
IIP	.946	.203
CRUDE	.933	.148
WPI	.921	.150
PROPERTY PRICE	.908	.207
CRR	.774	-.068
FII	-.070	.877
RS V/S D	.288	.564

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

This table (called the Pattern Matrix for oblique rotations) reports the factor loadings for each variable on the components or factors after rotation. Variables under each component extracted are observed and variables that are required to be grouped under factors are identified. From the above table it is clear that IIP, crude, property price, WPI and CRR has been clubbed under one factor whereas FII and RSVD has been grouped as second factor because they carried maximum value under second component.

Correlations

		DLF SHARE PRICE	Zscore: REGR factor score 1 for analysis 1	Zscore: REGR factor score 2 for analysis 1
Pearson Correlation	DLF SHARE PRICE	1.000	.838	.229
	Zscore: REGR factor score 1 for analysis 1	.838	1.000	.000
	Zscore: REGR factor score 2 for analysis 1	.229	.000	1.000
Sig. (1-tailed)	DLF SHARE PRICE	.	.000	.010
	Zscore: REGR factor score 1 for analysis 1	.000	.	.500
	Zscore: REGR factor score 2 for analysis 1	.010	.500	.
N	DLF SHARE PRICE	103	103	103
	Zscore: REGR factor score 1 for analysis 1	103	103	103
	Zscore: REGR factor score 2 for analysis 1	103	103	103

The correlations table displays Pearson correlation coefficients, significance values, and the number of cases with non-missing values. Pearson correlation coefficients assume the data are normally distributed. The above table shows that there is no correlation among the two factors formed. The significance level should not be greater than 0.05 and in the above case it is 0.5 which is considered good.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.869[a]	.755	.750	.49984491	.755	154.127	2	100	.000	.466

a. Predictors: (Constant), Zscore: REGR factor score 2 for analysis 1, Zscore: REGR factor score 1 for analysis 1

b. Dependent Variable: DLF SHARE PRICE

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This table displays R, R squared, adjusted R squared, and the standard error. R, the multiple correlation coefficient, is the correlation between the observed and predicted values of the dependent variable. Seeing the R square we can say that 75.5 times out of 100 model will give right results. As the data has been taken from sample R square is used and if the data would have been taken from population than Adjusted R square would have been taken.

ANOVA [b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	77.016	2	38.508	154.127	.000[a]
	Residual	24.984	100	.250		
	Total	102.000	102			

a. Predictors: (Constant), Zscore: REGR factor score 2 for analysis 1, Zscore: REGR factor score 1 for analysis 1

b. Dependent Variable: DLF SHARE PRICE

This table summarizes the results of an analysis of variance. Here the regression sum of squares should be greater than residual sum of squares and significance level should be <0.05. Both the conditions are satisfied in the above table.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3.67E-016	.049		.000	1.000	-.098	.098					
	Zscore: REGR factor score 1 for analysis 1	.838	.049	.838	16.938	.000	.740	.936	.838	.861	.838	1.000	1.000
	Zscore: REGR factor score 2 for analysis 1	.229	.049	.229	4.622	.000	.131	.327	.229	.420	.229	1.000	1.000

a. Dependent Variable: DLF SHARE PRICE

The unstandardized coefficients are the coefficients of the estimated regression model. The VIF should be lesser than 10 so that it proves that there is no problem of multicollinearity. The value of t-stat should be >2 and sig.<0.05. All the conditions are satisfied in the above table.

Collinearity Diagnostics [a]

| Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Zscore: REGR factor score 1 for analysis 1	Zscore: REGR factor score 2 for analysis 1
1	1	1.000	1.000	.63	.37	.00
	2	1.000	1.000	.00	.00	1.00
	3	1.000	1.000	.37	.63	.00

a. Dependent Variable: DLF SHARE PRICE

In the collinearity diagnostic table the condition index <15 if the index is greater than 15 than there is some problem with the sample taken. In the above table there is no problem.

Histogram

Dependent Variable: DLF SHARE PRICE

Mean = 6.07E-17
Std. Dev. = 0.99
N = 103
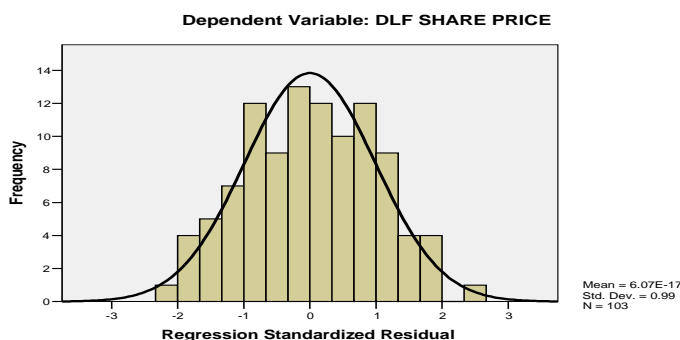
All the histograms are under the normal curve which shows that the data is normal.

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: DLF SHARE PRICE
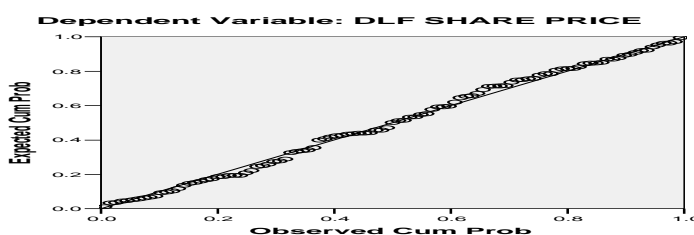
Seeing the P-P plot we can say there is no problem with the data and the observed and expected values are aligned line by line.

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REGRESSION ON BASIS OF FACTOR

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	% Confidence Interval for		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	67E-016	.049		.000	1.000	-.098	.098					
	Zscore: REGR fac score 1 for analys	.838	.049	.838	16.938	.000	.740	.936	.838	.861	.838	1.000	1.000
	Zscore: REGR fac score 2 for analys	.229	.049	.229	4.622	.000	.131	.327	.229	.420	.229	1.000	1.000

a. Dependent Variable: DLF SHARE PRICE

Based on the factors we have regression equation as:

Y= 3.67 E – 16 + 0.838 F1 + 0.229F2

Where,

Y= DLF share close prices

F1= factor 1 (IIP, crude, WPI, CRR, property prices)

F2= Factor 2 (FII and RSVD)

The above equation says that if there is 1% change in factor one DLF share price will change by 0.84% and if 1% change in factor2 than there will be change of 0.23% in DLF share price.

CONCLUSIONS

Various studies has already been done to find out the relationship between the Real Estate Prices and Stock Prices, Property Shares, Appraisals and the Stock Market and also the factors affecting the share & real estate prices in any country which mainly are IIP, FII, foreign exchange rate, WPI, CRR etc. Conclusion is that at CAGR of about 24% real estate sector future is very promising moreover the organized sector of the business is already untouched requiring more and more initiatives to be taken.

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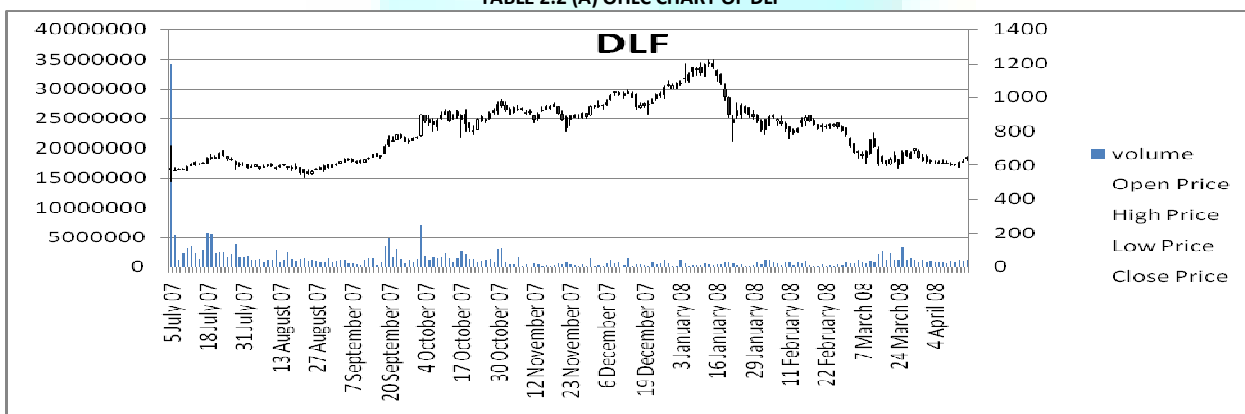
CHARTS

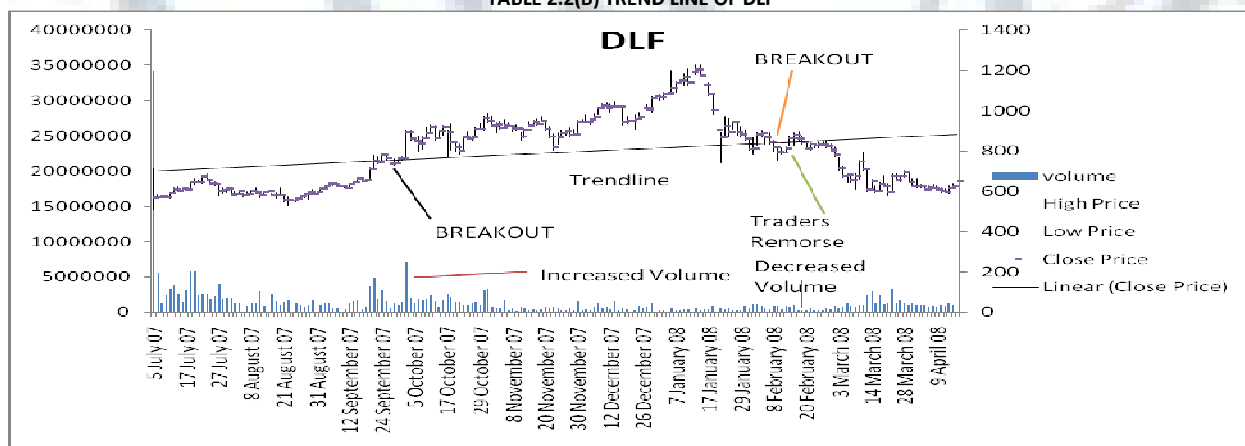**TABLE 2.2 (A) OHLC CHART OF DLF**

TABLE 2.2(B) TREND LINE OF DLF

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TABLE 2.3 SUPPORT & RESISTANCE LINE
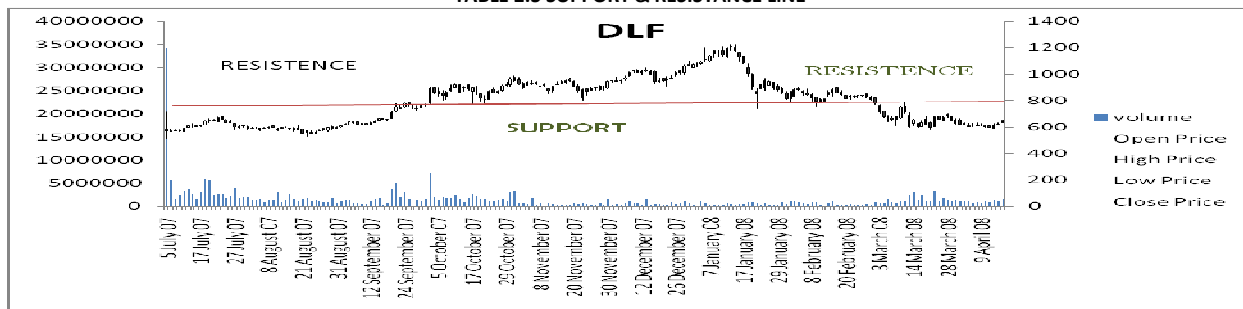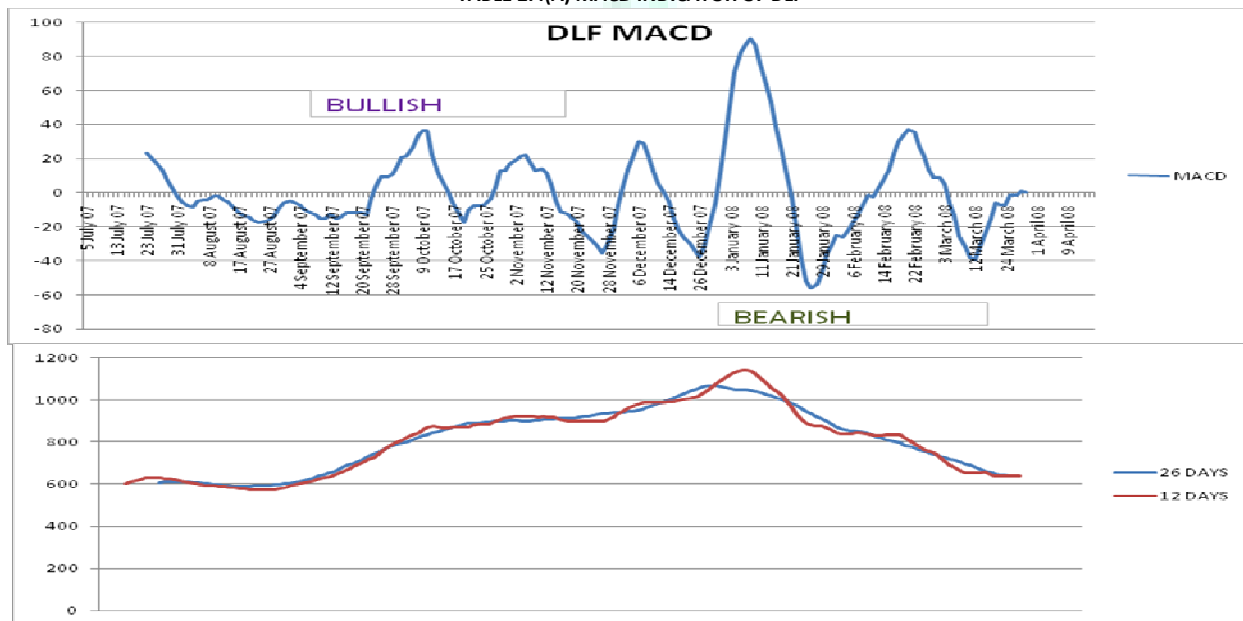

TABLE 2.4(A) MACD INDICATOR OF DLF

TABLE 2.4 (B) MACD INDICATOR OF DLF

TABLE 2.5 (A) STOCHASTIC OSSICLLATOR

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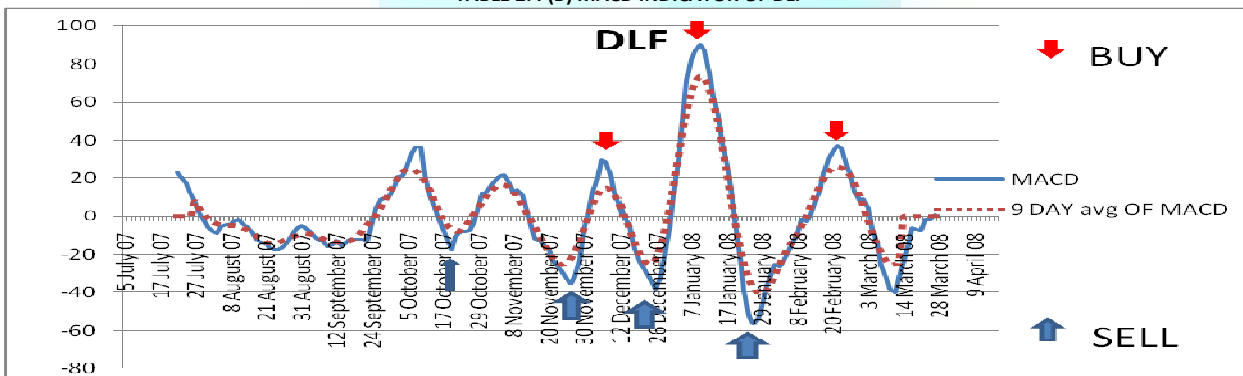
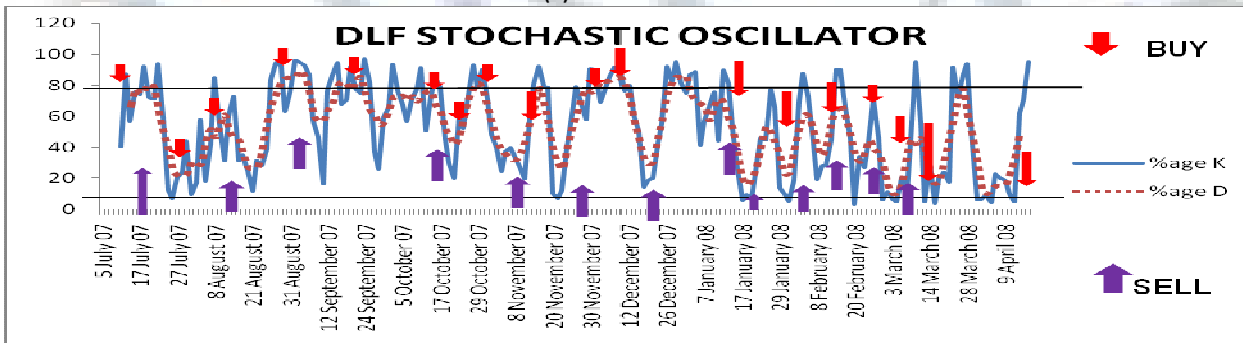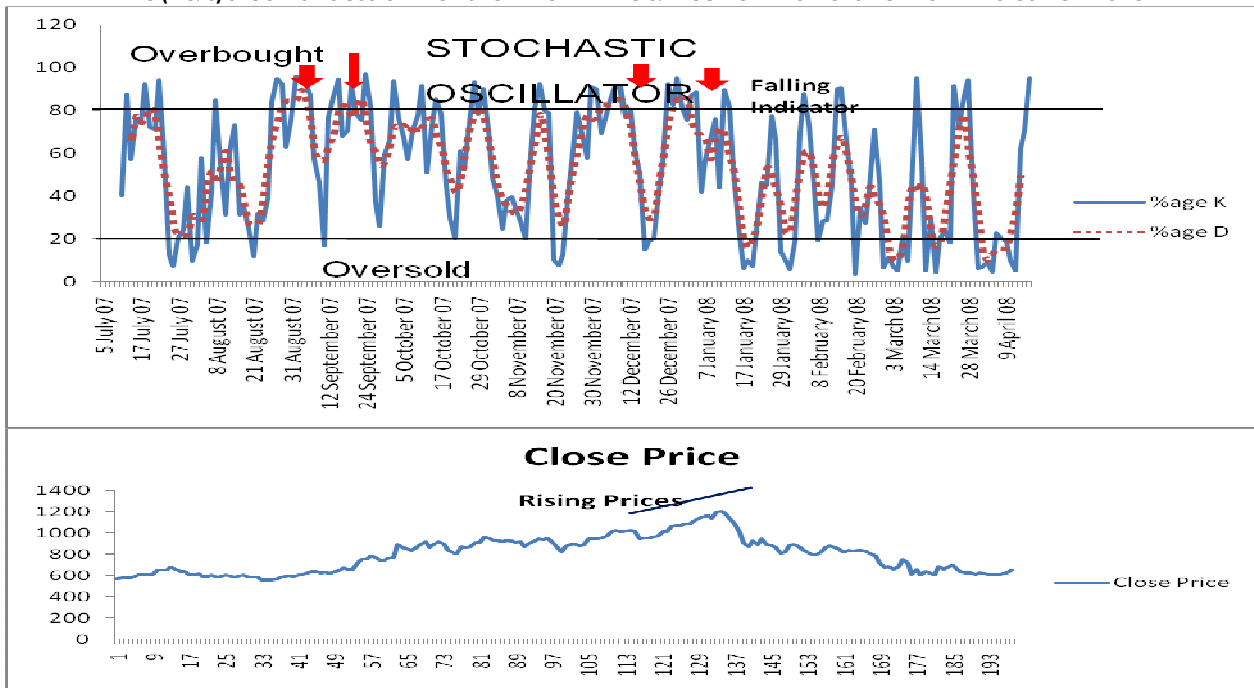**TABLE 2.5 (B & C) STOCHASTIC OSSICLLATOR SHOWING LEADING & LAGGING INDICATORS AGAINST THE CLOSING PRICE OF DLF**

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Thanking you profoundly

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