

# Investment and Trading Strategies in Indian Stock Market

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### Abstract

*The paper explores the investment and trading strategies for the Indian stock market using daily data for the CNX 100 companies over the period 01 April 2009 to 31 March 2014. The paper sets up the argument for beta and debt-equity ratio as the important variables for explaining the investment and trading strategies for Indian stock market. Following mean reversion principle without advocating for it, we also develop the strategy for trading in the stock market. The study uses data analysis techniques and arrives at the findings that long term investment in the stocks with low beta and low debt-equity ratio provide higher return, though short term trading the stocks with high beta and high debt-equity ratio provide high return in the short time period. The financial service sector shows that service sector provides very high return in the short time period and low return in the long run as compared to returns from the average stocks.*

**Keywords:** Beta, Debt-Equity Ratio, Technical Analysis, Trading and Investment Strategies

### 1. Introduction

Indian stock market has seen tremendous growth over the years in terms of participation, volume of trade, financial products, policies, innovations and strategies of investment. The market is getting increasingly integrated with the global financial markets. At the same time, the various financial markets within the economy are getting increased. The CNX 100 Index represents about 78.57 percent of the free float market capitalization of the stocks listed on NSE as on June 30, 2014. The total traded value for the last six months ending June 2014 of all index constituents is approximately 67.31 percent of the traded value of all stocks on the NSE.

The identification of the right stocks is the most important to any trading and investment strategies. The choice of right stocks depends on whether one is interested in trading or getting invested in the stock market. A stock good for trading may not be the right stock for the investment and vice versa. Again, the strategy of trading intra-day is different from the strategy for positional trading. The choice of investment is time dependent, that is, whether one is interested in the short term investment or long term investment. As far as risk is concerned, in the short run, it may not be that important to look at the unsystematic risk but in the long run one cannot afford to ignore firm specific risk. In the long run, fundamentally strong companies can withstand with the downside of the macroeconomic factors (systematic risk).

In the literature, different variables like market capitalization/size, leverages, price-earnings ratio, Sharpe ratio, debt-equity ratio, book-to-market equity, market index, etc are considered along with beta to understand the returns of the stocks. It is an empirical issue whether beta independently or combined with other variables explain the returns of the stocks in an economy. The different models are available in the literature to explain the returns and take appropriate strategies for trading and investment. Again it is difficult to research and adopt the different strategies for the investors. It is desirable to use public information or data instead of complicated analysis expected from investor. Using the rigor of financial theory and public information may help to adopt simple but desirable strategies for the investment.

The present paper assumes that both risk and leverage factors explain the returns of the stocks both in the short run and long run. We considered only beta and debt-equity ratio as respective factors for risk and leverage to keep the analysis simple, and at the same time we are convinced that in the limited sense, these two factors can explain the risk-return phenomenon. Therefore, the objective of the paper is to understand the returns of the stocks considering these two factors and to suggest trading strategy for the players in the stock market.

## **2. Review of Literature**

A general perceived notion is that higher you take the risk, higher you get the expected return (CAPM model). The model suggests that an investor's cost of equity capital is determined by beta. Looking at beta of the stock, if one is interested for higher return, he has to choose the stock with high beta. However, there is little empirical support to this. The cross section of average returns on US common stocks shows little relation to the market beta of asset pricing model (Fama and French, 1992). On the other hand, variables that have no special standing in asset-pricing theory show reliable power to explain the cross section of average returns (Fama and French, 1993).

The individual risk of securities can be diversified away but the contribution to the total risk caused by the covariance term cannot be diversified away (Elton et al, 2014). The risk that is not eliminated is the risk associated with the term beta. The measure of the contribution of a security to the risk of a large portfolio is beta. It is thought of as taking more or less risky than the market according to whether their beta is larger or smaller than one. The diversifiable risk or market risk can be eliminated or reduced by holding a large portfolio, the effect of beta does not diminish as the number of stocks (n) gets larger.

The stocks with lower market capitalization tend to have higher average return (Banz, 1981). Fama and French (2012) reports on the basis of literature survey that the stocks with high fundamental ratios (value stocks) like book value or cash flow to price have higher average returns than the stocks with low ratios of fundamental to price (growth stocks). The US stock returns also exhibit momentum, that is, the stocks that

have done well in the past years tend to continue to do well (Jegadeesh and Titman, 1993). This suggests taking into consideration the fundamental factors of the company and the economy to explain the returns of the stocks.

The inverse relationship between the market value of equity and stock returns is not primarily a size effect, but it seems to be most prevalent in small, highly leveraged company in US economy (Leledakis et al, 2008). The investigation by Horowitz et al (1996) using US data does not support the prevalent use of size as an explanatory variable for returns. Berk (1996) uses all NYSE firms and finds that the market value does not provide significant additional explanatory power over the single beta model. There is no evidence of the size effect due to the existence of a relationship between expected return and firm size rather the size effect is due to the endogenous identity relating to market value of firm to its discount rate. The study of Fama and French (2012) finds value premiums in average returns in North America, Europe, Japan and Asia Pacific. There are strong momentum returns in all regions except Japan. Their study also finds that four-factor model performs as well or better than the three-factor model or the CAPM.

The beta coefficient of the CAPM model as the sole measures of risk has been contested in other economies. The empirical test of multifactor approach to asset pricing for China shows that market factor alone is not sufficient to describe the cross section of average stock returns (Drew et al, 2003). The study also finds that small and growth firms generate superior returns than big and value firms. This result is against the finding of Fama and French, 1996. The non-beta risks are associated with firm size and book-to-market equity in the presence of any event. The paper suggests that an average investor must simply hold the market portfolio only, and the investors willing to take additional risk for taking advantages of extra returns must consider firm size and book-to-market equity in their portfolio strategies.

The empirical examination of Fama-French model with Indian data do not show evidence of cross sectional mean returns being explained by market factor alone; whereas, Indian stock market is consistent with Fama-French three- factor model, the factors being pervasive market, size and book-to-market (Connor and Sehgal, 2001).

### **3. Investment and Trading Strategies in the Stock Market**

#### **3.1 Investment Strategies**

Investment strategy in the stock market is to choose portfolio of stocks with trade-off between return and risk. In the literature, investors can optimize their investment either by preferring minimum risk with given level of expected return or by preferring to maximize expected return for given level of risk (portfolio diversification theory). However, most investors select a strategy somewhere in between with the expectation to have low risk and high return. As a result, investors often end up with a 'buy-high, sell-low' strategy (Jafee, 2014).

One of the better known investment strategies is buy and hold. It is a long term investment strategy based on the concept that in the long run equity market gives a good rate of return despite periods of volatility or decline. A purely passive variant of this strategy is indexing where an investor buys a small proportion of all the stocks in a market index such as Nifty-500 or more likely in a mutual fund ETF. On the other hand, market timing, an active investment strategy is to enter the market on the lows and sell on the highs to maximize returns. Trading strategy attempts to predict future market movements based on an outlook of market or economic conditions resulting from technical or fundamental analysis. There is no clear evidence

in the literature whether this strategy is a viable investment strategy. Some believes market cannot be overvalued or undervalued, the prices always exhibit random walk behavior and hence cannot be predicted with consistency or certainty (Efficient Market Hypothesis).

In a broader level, it has been observed that stocks with low beta may generate better return than high beta stocks as against the standard theory at least in the long run if stocks are chosen on the basis of strong fundamentals. Frezzini et al (2013) finds that Buffett does not chase trends in his stock selection. In their analysis, it is found that Buffett has a tendency to buy safe (low beta) stocks while shying away from risky (high beta) stocks. Also, Buffett buys high quality companies, that is, companies that are profitable, growing, safe, and have high payout. Buffett says “It’s far better to buy a wonderful company at a fair price than a fair company at a wonderful price” (Annual Report, 1989).

The performance of the stocks can largely be explained by exposure to value, low-risk, and quality factors. On average, value stocks outperform growth stocks and high-quality stocks outperform junk stocks (Frazzini et al, 2013). The high Sharpe ratio indicates the higher return. Frazzini et al (2013) finds that Buffett’s vehicle of investment Berkshire Hathaway has higher Sharpe ratio than all U.S. mutual funds and it is 0.76 over the period 1976-2011 which is almost double of the overall stock market. With high Sharpe ratio, using leverage, and stuck to a good strategy for a very long time period even standing firm at high risk period, one can boost return.

Businesses invariably spend significant amounts of money (debt) before their products and services generate sales. The relative significance of pre-production costs and the time required to develop products or services varies across industries and companies. Pre-production outlays dampen operating profit margins. Subsequent sales growth, on the other hand leads to higher operating profit margins, the so called operating leverage. Operating leverage does not help to improve margins and is inadequate to pay the interest cost/principal. Good business or investment decision, Buffet says, ‘will produce quite satisfactory results with no aid from leverage.’ Highly leverage companies are vulnerable during economic slowdowns. Buffet would rather err on the side of financial quality than risk the welfare of business shareholders by increasing the risk that is associated with high debt levels.

One of the important fundamental factors, the leverage factor may be the D-E ratio. Other things remaining the same, for the given beta it is expected that higher D-E ratio, lower is the return and vice-versa. Usually, beta and D-E ratio are respectively positively and negatively related with the expected return. When both opposite forces, beta and D-E ratio are combined, it is important to see which factor dominates and generate higher returns. It is an empirical issue to be established with the historical data.

For an investor, it is difficult to consider multiple factors and strategies. Again an investor is not rational in his behavior of chasing risk. This is largely confirmed by Keynes (1936) many decades back and still largely true. ‘Even apart from the instability due to speculation, there is the instability due to the characteristic of human nature that a large portion of our positive activities depend on spontaneous optimism rather than mathematical expectations, whether moral or hedonistic or economic.’

Many of the obstacles to investment success relate to human emotion. The main reason for the failure of the efficient market hypothesis (EMH) is that investors rarely satisfy the requirement of objectivity. Warren Buffet has famously said that his ‘holding period is forever’. This allows him to stick with great ideas for

long periods of time, compounding his gains and allowing profits to build up untaxed, rather than turning over the portfolio every year and paying taxes at short term rates.

### **3.2 Trading Strategies**

Trading strategies are for very short time period ranging from intra-day trading to positional trading for few months. Intra-day trading takes place looking at the momentum of the stock and hence is usually based on technical analysis. In addition to technical analysis, there is scope for considering the occurrence of events, developments in the other related financial markets, etc. There could be release of inflation and output data, corporate announcements, settlements in the derivatives markets, et cetera.

Trading strategies are usually based on both fundamental and technical analysis of the stocks under consideration. Technical strategies take into consideration the mean-reversion, momentum of stocks, and also the events. The technical strategies are usually verified by back-testing with scientific method.

Usually the performance of a trading strategy is measured on the risk-adjusted basis and probably the most known risk-adjusted measure is the Sharpe ratio. However in practice one usually compares the expected return against the volatility of returns and or the maximum drawdown. Normally, higher expected return implies higher volatility and drawdown. However, the point that ‘the choice of the risk-reward trade-off strongly depends on trader’s risk preference’ cannot be ignored.

For any trading strategy, it is important to pick the right stocks to trade, and right time to enter and exit. A cursory look at the data shows that in 2-3 months stock market provides fairly good returns. This hints at carrying out technical analysis of positional trading in the stock market in the 2-3 months. Also considering that the derivatives market is active over the nearest one to three months helps. In positional trade, not always right but on the average more right than wrong, helps to cut loses and run profit.

Generally, it is very difficult to predict the market’s direction and particularly difficult to do so with any consistency. Getting 2/3 correct will be a good average. Stock chart/ technical analysis / moving averages and relative strength are helpful for entry/exit. It is difficult to find the bottom, only in hindsight would one know about it. Mean reversion is one of the great truisms of capitalism. When an investor focuses on short term investments, he should observe the variability of the portfolio, not the returns.

An investment and trading operations are one which upon thorough analysis promises safety of principal and a satisfactory return. We are replacing complex analysis with beta, debt-equity ratio, and mean reversion trading, and yet we believe that it will not undermine the result especially for investors given the reasons stated above. As Friedman (1953) says – “the relevant question to ask about the assumptions of a theory is not whether they are descriptively realistic for they never are, but whether they are sufficiently good approximation for the purpose on hand”. All scientific theories are unrealistic simplification. It is by breaking down the complexity of reality to unrealistic models that science progress. Thus no absolute law or theory is being proposed but a plausible guideline for investment and trading strategies is suggested. In investment it is important to play a test match of the Sunil Gavaskar caliber. Lots of patience, respect for the bowlers and the pitch, and not losing your wicket (capital in case of investment). Trading is T-20 match where you take probabilistic decision on each ball and on the average try to score (or make some trading gains).

#### 4. Data and Methodology

The study uses daily data of 92 companies listed in CNX-100 of India for the sample period 01 April 2009 to 31 March 2014<sup>1</sup>. The raw variables used in the study are stock prices, market capitalization, beta and debt-equity ratio (D/E). We have collected historical closing prices data from NSE website and four companies' stock prices are taken from BSE website. The free float market capitalization data and one year beta are collected from the official website of sharekhan, whereas debt-equity ratio is collected from moneycontrol.com. The prices series for all the stocks under consideration are adjusted to splits and bonus uniformly.

The sample period is five years, a period where the world economy was attempting to emerge from one of the worst financial crises. Also, taking into consideration 92 of companies individually the diversification of stocks enhances the power of analysis. According to Buffet, "in investing, it is not necessary to do extraordinary things to get extraordinary results" (Annual Report, 1994). The study sticks to the basic and uses very simple methods like trend analysis, simple and weighted averages, CAGR, standard deviation, et cetera.

#### 5. Empirical Analysis and Discussion of Results

The list of 92 companies considered for empirical analysis is provided with broad indicators, viz., beta, debt-equity ratio and market capitalization in table 1. The estimate of the beta of each stock is a potential candidate for inclusion in a portfolio. The error in measuring the true beta and the possibility of real shifts in beta over time may justify the limitations of beta under consideration in the present study.

We have profiled the stocks on the basis of beta and debt-equity ratio from highest to lowest respectively in table 2 and table 3. Most of the stocks with high beta belong to financial services sector with YESBANK having highest beta of 2.36 (see table 2). The LICHSGFIN is having very high debt-equity ratio of 8.42, whereas it is lowest for BOSCHLTD with the ratio 0.02 only (see table 3)<sup>2</sup>. It is clearly visible that there is positive correlation between beta and debt-equity ratio.

The study considered beta and debt-equity ratio as important factors explaining the returns of stock. We have grouped the stocks under three broad categories; (i) Category 1- stocks with low beta and low D/E ( $Beta, D/E \leq 0.5$ ), (ii) Category 2- stocks with medium beta and medium D/E ( $0.5 < Beta, D/E \leq 1$ ), and (iii) Category 3- stocks with high beta and high D/E ( $Beta, D/E > 1$ ).<sup>3</sup> There are 16 companies/stocks falling under first category with average beta of 0.384 and D-E ratio 0.105. We have only 7 companies/stocks in our second category of medium beta and medium D-E ratio. The average beta and D-E ratio of these stocks are 0.72 and 0.69 respectively. We have 9 companies/stocks in the third category.

The above analysis of stocks excludes most of the stocks/companies of financial services sector due to non-availability/meaningless of D-E ratio. Therefore, we have carried out a separate exercise for this sector and presented the result in table 5. We have 22 companies/stocks in this category with average beta of 1.56. Barring three stocks, all others have beta value greater than one indicating high risk stocks.



**Table 1: List and Profiles of NSE CNX-100 Stocks\***

Stocks	Beta	D/E	Market Cap	Stocks	Beta	D/E	Market Cap
ACC	0.92	0.01	24001.22	INFY	0.39	-	182429.09
ADANIENT	1.42	0.48	46879.4	JSWSTEEL	1.17	0.86	26703.03
ADANIPTS	0.74	1.16	38513.31	JINDALSTEL	1.08	1.58	22304.92
ABIRLANUVO	1.08	0.53	14573.42	KOTAKBANK	1.34	-	62213.5
AMBUJACEM	0.99	0.01	31322.69	LICHSGFIN	1.66	8.42	13285.25
APOLLOHOSP	0.5	0.33	13291.32	LT	1.24	0.27	119026.83
ASIANPAINT	1.28	0.02	49744	LUPIN	0.37	0.11	44749.23
AXISBANK	1.73	-	73023.44	M&MFIN	0.87	3.21	14031.43
BAJAJ-AUTO	0.8	0.01	55525.19	M&M	0.84	0.22	65259.96
BANKBARODA	1.65	-	34867.77	MARUTI	0.89	0.07	57330.26
BANKINDIA	2.01	-	14420.79	MPHASIS	0.39	0.07	8645.29
BHARATFORG	0.79	0.64	9440.9	NMDC	0.93	-	58519.21
BHEL	1.43	0.05	43555.04	NTPC	0.74	0.66	94699.16
BPCL	1.22	1.42	33815.03	ONGC	1.24	0.04	290972.22
BHARTIARTL	1.13	0.24	128036.73	PETRONET	0.68	0.61	11025
BOSCHLTD	0.2	0.02	32898.83	PFC	1.7	5.8	25740.79
CAIRN	0.42	0.04	64018.93	POWERGRID	0.56	2.62	54905.53
CANBK	1.86	-	14029.19	PNB	1.67	-	28380.85
CIPLA	0.46	0.11	31538.75	RANBAXY	1.23	2.48	19787.49
COLPAL	0.48	0.01	19527.21	RELCAPITAL	1.7		8278.36
CONCOR	0.24	-	18948.57	RCOM	1.44	0.92	24314.24
CROMPGREAV	1.28	0.01	10425.92	RELIANCE	1.09	0.3	309941.73
CUMMINSIND	0.5	0.01	14871.78	RPOWER	1.29	0.11	19004.73
DLF	1.84	0.76	30439.9	RECLTD	1.52	5.36	25027.15
DABUR	0.44	0.15	31301.44	SSLT	1.17	0.35	53453.08
DIVISLAB	0.41	0.01	18063.81	SRTRANSFIN	0.98	3.22	16449
DRREDDY	0.48	0.2	46425.26	SIEMENS	1.11	-	23778.12
EXIDEIND	0.67	0.04	10183	SBIN	1.15	-	153144.54
FEDERALBNK	1.66	-	7945.85	SAIL	1.05	0.52	27695.17
GAIL	0.69	0.35	47187.36	SUNPHARMA	0.8	0.01	129137.07
GLENMARK	0.26	0.12	16531.08	TATACHEM	0.58	0.46	7298.77
GODREJCP	0.56	0.09	27109.43	TCS	0.49	0.01	429588.22
GRASIM	0.87	0.12	24229.63	TATAGLOBAL	0.69	0.08	9022.44
HCLTECH	0.29	0.06	96671.18	TATAMOTORS	1.06	0.75	135039.1
HDFCBANK	1.29	-	172082.22	TATAPOWER	1.05	0.91	20812.09
HEROMOTOCO	0.7	0.06	44093	TATASTEEL	1.31	0.48	38936.03
HINDALCO	1.26	0.72	28677.42	TECHM	0.23	0.26	41357.55
HINDPETRO	1.16	2.36	11345.71	TITAN	0.99	0.07	24391.92
HINDUNILVR	0.62	0.2	120494.62	UPL	0.66	0.61	12573.11
HDFC	1.29	4.35	138333.41	ULTRACEMCO	0.93	0.29	54299.79
ITC	0.91	0.01	274093.02	UNIONBANK	1.91	-	9719.32
ICICIBANK	1.59	-	144700.89	UBL	0.79	0.96	20681.77
IDFC	1.69	2.98	16626.82	MCDOWELL-N	0.7	0.53	40401.11
INGVYSYABK	0.95	-	11043.87	WIPRO	0.22	0.17	124085.39
IDEA	0.69	0.8	43290.47	YESBANK	2.36	-	16053.11
INDUSINDBK	1.72	-	25276.02	ZEEL	0.68	0.04	26763.78

\*Note: We have finally considered 92 stocks from NSE-100, due to non-availability of complete data series for BAJAJFINSV, INFRATEL, COALINDIA, GLAXO, OIL for our study period, and GSKCONS, BAJAJHLDNG, OFSS for...

Source: NSE and BSE websites

**Table 2: Profiles/Ranks of Stocks on the Basis of Beta**

<b>Stocks</b>	<b>Beta</b>	<b>D/E</b>	<b>Stocks</b>	<b>Beta</b>	<b>D/E</b>
YESBANK	2.36	-	INGVYSYABK	0.95	-
BANKINDIA	2.01	-	NMDC	0.93	-
UNIONBANK	1.91	-	ULTRACEMCO	0.93	0.29
CANBK	1.86	-	ACC	0.92	0.01
DLF	1.84	0.76	ITC	0.91	0.01
AXISBANK	1.73	-	MARUTI	0.89	0.07
INDUSINDBK	1.72	-	GRASIM	0.87	0.12
PFC	1.7	5.8	M&MFIN	0.87	3.21
RELCAPITAL	1.7	-	M&M	0.84	0.22
IDFC	1.69	2.98	BAJAJ-AUTO	0.8	0.01
PNB	1.67	-	SUNPHARMA	0.8	0.01
FEDERALBNK	1.66	-	BHARATFORG	0.79	0.64
LICHSGFIN	1.66	8.42	UBL	0.79	0.96
BANKBARODA	1.65	-	ADANIPTS	0.74	1.16
ICICIBANK	1.59	-	NTPC	0.74	0.66
RECLTD	1.52	5.36	HEROMOTOCO	0.7	0.06
RCOM	1.44	0.92	MCDOWELL-N	0.7	0.53
BHEL	1.43	0.05	GAIL	0.69	0.35
ADANIEN	1.42	0.48	IDEA	0.69	0.8
KOTAKBANK	1.34	-	TATAGLOBAL	0.69	0.08
TATASTEEL	1.31	0.48	PETRONET	0.68	0.61
HDFCBANK	1.29	-	ZEEL	0.68	0.04
HDFC	1.29	4.35	EXIDEIND	0.67	0.04
RPOWER	1.29	0.11	UPL	0.66	0.61
ASIANPAINT	1.28	0.02	HINDUNILVR	0.62	0.2
CROMPGREAV	1.28	0.01	TATACHEM	0.58	0.46
HINDALCO	1.26	0.72	GODREJCP	0.56	0.09
LT	1.24	0.27	POWERGRID	0.56	2.62
ONGC	1.24	0.04	APOLLOHOSP	0.5	0.33
RANBAXY	1.23	2.48	CUMMINSIND	0.5	0.01
BPCL	1.22	1.42	TCS	0.49	0.01
JSWSTEEL	1.17	0.86	COLPAL	0.48	0.01
SSLT	1.17	0.35	DRREDDY	0.48	0.2
HINDPETRO	1.16	2.36	CIPLA	0.46	0.11
SBIN	1.15	-	DABUR	0.44	0.15
BHARTIARTL	1.13	0.24	CAIRN	0.42	0.04
SIEMENS	1.11	-	DIVISLAB	0.41	0.01
RELIANCE	1.09	0.3	INFY	0.39	-
ABIRLANUVO	1.08	0.53	MPHASIS	0.39	0.07
JINDALSTEL	1.08	1.58	LUPIN	0.37	0.11
TATAMOTORS	1.06	0.75	HCLTECH	0.29	0.06
SAIL	1.05	0.52	GLENMARK	0.26	0.12
TATAPOWER	1.05	0.91	CONCOR	0.24	-
AMBUJACEM	0.99	0.01	TECHM	0.23	0.26
TITAN	0.99	0.07	WIPRO	0.22	0.17
SRTRANSFIN	0.98	3.22	BOSCHLTD	0.2	0.02

Source: Authors' Own Calculation and Compilation based on Table 1



**Table 3: Profiles/Ranks of Stocks on the Basis of D-E Ratio**

Stocks	D/E	Beta	Stocks	D/E	Beta
LICHSGFIN	8.42	1.66	TECHM	0.26	0.23
PFC	5.8	1.7	BHARTIARTL	0.24	1.13
RECLTD	5.36	1.52	M&M	0.22	0.84
HDFC	4.35	1.29	DRREDDY	0.2	0.48
SRTRANSFIN	3.22	0.98	HINDUNILVR	0.2	0.62
M&MFIN	3.21	0.87	WIPRO	0.17	0.22
IDFC	2.98	1.69	DABUR	0.15	0.44
POWERGRID	2.62	0.56	GLENMARK	0.12	0.26
RANBAXY	2.48	1.23	GRASIM	0.12	0.87
HINDPETRO	2.36	1.16	CIPLA	0.11	0.46
JINDALSTEL	1.58	1.08	LUPIN	0.11	0.37
BPCL	1.42	1.22	RPOWER	0.11	1.29
ADANIPTS	1.16	0.74	GODREJCP	0.09	0.56
UBL	0.96	0.79	TATAGLOBAL	0.08	0.69
RCOM	0.92	1.44	MARUTI	0.07	0.89
TATAPOWER	0.91	1.05	MPHASIS	0.07	0.39
JSWSTEEL	0.86	1.17	TITAN	0.07	0.99
IDEA	0.8	0.69	HCLTECH	0.06	0.29
DLF	0.76	1.84	HEROMOTOCO	0.06	0.7
TATAMOTORS	0.75	1.06	BHEL	0.05	1.43
HINDALCO	0.72	1.26	CAIRN	0.04	0.42
NTPC	0.66	0.74	EXIDEIND	0.04	0.67
BHARATFORG	0.64	0.79	ONGC	0.04	1.24
PETRONET	0.61	0.68	ZEEL	0.04	0.68
UPL	0.61	0.66	ASIANPAINT	0.02	1.28
ABIRLANUVO	0.53	1.08	BOSCHLTD	0.02	0.2
MCDOWELL-N	0.53	0.7	ACC	0.01	0.92
SAIL	0.52	1.05	AMBUJACEM	0.01	0.99
ADANIENT	0.48	1.42	BAJAJ-AUTO	0.01	0.8
TATASTEEL	0.48	1.31	COLPAL	0.01	0.48
TATACHEM	0.46	0.58	CROMPGREAV	0.01	1.28
GAIL	0.35	0.69	CUMMINSIND	0.01	0.5
SSLT	0.35	1.17	DIVISLAB	0.01	0.41
APOLLOHOSP	0.33	0.5	ITC	0.01	0.91
RELIANCE	0.3	1.09	SUNPHARMA	0.01	0.8
ULTRACEMCO	0.29	0.93	TCS	0.01	0.49
LT	0.27	1.24			

Source: Authors' Own Calculation and Compilation

### 5.1 Investment Analysis

To carry out the investment analysis, we have calculated one year and five year CAGR for the three categories stated above and also for the financial services sector. This is presented in tables 4 and 5. The

values in the parenthesis are the standard deviations. The CNX100 generates 0.065 percent in one year and 5.38 percent returns in five years based on 1 year CAGR and 5 year CAGR respectively. The stocks in of first category generate on an average return of 0.10 percent with 0.1 standard deviation based on 1 year CAGR. The stocks with low beta and low debt-equity ratio (category 1) generate around 16 percent return based on 5 year CAGR with range from -5.62 to 30.56 percent (see table 4(a)). The stock CILPA generates negative returns in the short run (one year) but in the long run (5 years) it generates positive return of over 7 percent. There is also evidence that stock like MPHASIS generates positive return in the short run whereas it generates negative return of -5.62 percent in the long run.

The average return of the stocks in the second category stands at 0.09 percent (with standard deviation 0.12) based on 1 year CAGR whereas the same is at 12.3 percent (with standard deviation 15.28) based on 5 year CAGR (see table 4(b)). The return based on 5 year CAGR ranges from -7.63 (NTPC) to as high as 39.49 percent (UBL). The NTPC generates negative returns both in the short run and long run. The PETRONET is the only stock which generates very low negative return in one year but in 5 years it generates 12.6 percent return.

The third category of stocks with high beta and high debt-equity ratio generates very low return of 0.00045 percent on one year CAGR but provides negative return of -0.31 percent on the basis of 5 year CAGR. (See table 4(c)). There are respectively three and four stocks generating negative return based on 1 year and 5 year CAGR calculations. Again there is the evidence of stocks generating positive returns in the short run and negative returns in the long run (PFC and HINDPETRO). Also, the stocks like IDFC and JINDALSTEL generates negative returns both in the short run and long run. An average stock provides negative return based on 5 years CAGR though 5 companies (out of 9) are generating positive average returns.

The financial services sector generates very low but positive average return of 0.004 percent (based on 1 year CAGR) and only 6.4 percent (based on 5 year CAGR). There is the evidence of stocks generating positive returns in the short run and negative returns in the long run, and also negative returns both in the short run and long run. An average stock provides positive returns both in the short run and long run though based on 5 years CAGR though 8 stocks (out of 22) are generating negative returns.

The result reinforces the fact that it is better to invest in low beta and low debt-equity ratio.

**Table 4(a): Returns of stocks with low Beta ( $\leq 0.5$ ) and low D-E Ratio ( $\leq 0.5$ )**

Stocks	(Beta, D/E $\leq 0.5$ )		CAGR_	CAGR_	Return_	Return_
	Beta	D/E	1 year (%)	5 year (%)	L to 50d (%)	L to 50% (Days)
APOLLOHOSP	0.5	0.33	0.037	26.36	40.88	40
CUMMINSIND	0.5	0.01	0.070	12.55	44.90	30
TCS	0.49	0.01	0.126	27.05	44.01	58
COLPAL	0.48	0.01	0.029	16.23	23.44	63
DRREDDY	0.48	0.2	0.135	20.66	51.12	44
CIPLA	0.46	0.11	-0.002	7.02	29.35	128
DABUR	0.44	0.15	0.094	18.43	25.47	117
CAIRN	0.42	0.04	0.061	4.21	25.51	130
DIVISLAB	0.41	0.01	0.126	14.34	20.35	149
MPHASIS	0.39	0.07	0.017	-5.62	91.81	28
LUPIN	0.37	0.11	0.156	29.69	29.68	73
HCLTECH	0.29	0.06	0.226	30.56	87.44	17
GLENMARK	0.26	0.12	0.077	18.01	30.30	32
TECHM	0.23	0.26	0.210	11.64	187.78	30
WIPRO	0.22	0.17	0.092	7.28	49.25	20
BOSCHLTD	0.2	0.02	0.083	17.38	6.53	150
<b>N=16</b>	<b>0.384(0.1)</b>	<b>0.105(0.1)</b>	<b>0.10(0.06)</b>	<b>15.99(9.86)</b>	<b>49.24(43.34)</b>	<b>69.31(48.51)</b>

<b>Table 4(b): Returns of stocks with 0.5&lt;Beta, D-E Ratio ≤1</b>						
Stocks	(0.5<Beta, D/E≤1)		CAGR_	CAGR_	Return_	Return_
	Beta	D/E	1 year (%)	5 year (%)	L to 50d (%)	L to 50% (Days)
UBL	0.79	0.96	0.057	39.49	29.22	21
IDEA	0.69	0.80	0.071	17.90	17.16	194
NTPC*	0.74	0.66	-0.072	-7.63	n.a.	n.a.
BHARATFORG	0.79	0.64	0.290	4.55	67.90	26
PETRONET	0.68	0.61	-0.005	12.63	62.93	27
UPL	0.66	0.61	0.172	0.71	40.09	31
MCDOWELL-N	0.70	0.53	0.134	18.52	12.61	26
<b>N=7</b>	<b>0.72(0.05)</b>	<b>0.69(0.15)</b>	<b>0.09(0.12)</b>	<b>12.31(15.28)</b>	<b>38.32(23.13)</b>	<b>54(68.58)</b>
<b>Table 4(c): Returns of stocks with high Beta (&gt;1) and high D-E Ratio (&gt;1)</b>						
Stocks	(Beta, D/E>1)		CAGR_	CAGR_	Return_	Return_
	Beta	D/E	1 year (%)	5 year (%)	L to 50d (%)	L to 50% (Days)
LICHSGFIN	1.66	8.42	0.017	9.81	148.77	16
PFC	1.7	5.8	0.021	-7.36	31.82	62
RECLTD	1.52	5.36	0.032	0.39	71.97	25
HDFC	1.29	4.35	0.027	10.82	51.13	27
IDFC	1.69	2.98	-0.060	-3.79	130.03	18
RANBAXY	1.23	2.48	-0.085	1.65	53.63	19
HINDPETRO	1.16	2.36	0.036	-6.98	29.49	113
JINDALSTEL	1.08	1.58	-0.063	-14.11	36.82	83
BPCL	1.22	1.42	0.079	6.81	28.72	82
<b>N=9</b>	<b>1.394(0.25)</b>	<b>3.861(2.32)</b>	<b>0.00045(0.06)</b>	<b>-0.31(8.5)</b>	<b>64.71(44.84)</b>	<b>49.44(36.26)</b>
<b>CNX100</b>			<b>0.065</b>	<b>5.38</b>		

Source: Authors' Own Calculation and Compilation

<b>Table 5: Risk-Return Analysis of Financial Services Sector</b>						
Stocks	Beta	Market Cap	CAGR_	CAGR_	Return_	Return_
			1 year (%)	5 year (%)	L to 50d (%)	L to 50% (Days)
AXISBANK	1.73	73023.44	0.041849	6.26028	75.30	18
BANKBARODA	1.65	34867.77	0.020445	4.850494	84.24	27
BANKINDIA	2.01	14420.79	-0.11985	-8.32063	64.86	43
CANBK	1.86	14029.19	-0.15517	-2.1062	50.49	27
FEDERALBNK	1.66	7945.85	-0.00476	10.68793	69.39	27
HDFCBANK	1.29	172082.2	0.07276	16.4039	52.49	44
HDFC	1.29	138333.4	0.027381	10.82115	51.13	27
ICICIBANK	1.59	144700.9	0.067318	6.06753	101.30	17
IDFC	1.69	16626.82	-0.06049	-3.79332	130.03	18
INGVYSYABK	0.95	11043.87	0.062057	19.1368	28.39	74
INDUSINDBK	1.72	25276.02	0.075063	31.64455	141.35	28
KOTAKBANK	1.34	62213.5	0.071976	15.21644	112.57	18
LICHSGFIN	1.66	13285.25	0.016536	9.814244	148.77	16
M&MFIN	0.87	14031.43	0.093017	36.67363	29.71	137
PFC	1.7	25740.79	0.021177	-7.36146	31.82	62
PNB	1.67	28380.85	0.010308	-4.67381	52.11	27
RELCAPITAL	1.7	8278.36	0.028344	-15.9044	73.64	29

RECLTD	1.52	25027.15	0.031952	0.387676	71.97	25
SRTRANSFIN	0.98	16449	0.026842	11.2215	57.89	26
SBIN	1.15	153144.5	-0.03439	-1.13825	58.09	28
UNIONBANK	1.91	9719.32	-0.18546	-8.99928	23.57	n.a.
YESBANK	2.36	16053.11	-0.01728	14.73958	147.82	10
<b>N=22</b>	<b>1.56(0.36)</b>		<b>0.004(0.07)</b>	<b>6.438(13.04)</b>	<b>75.31(39.05)</b>	<b>34.67(27.94)</b>
Source: Authors' Own Calculation and Compilation						

## 5.2 Trading Analysis

In the first category, BOSCHLTD provides only 6.53 percent return in 50 days (lowest in its category) and takes almost 5 months (highest in its category) to generate 50 percent return from its lowest point. The TECHM provides remarkable return of 187.78 percent in 50 days from its minimum point and takes only one month to generate 50 percent return. There are other companies like DABUR, CIPLA, CAIRN and DIVISLAB are very slow to recover from their bottom and take 4 to 5 months (117-149 days) to generate 50 percent return. However, on an average, stocks in this category provides 50 percent return from their all time low values and takes about 69 days to generate 50 percent return from their all time low points during the study period. (See table 4(a) for the detail).

In the second category, the UBL bounce back very quickly to generate 50 percent return from its lowest point in only three weeks. This stock generates 29.2 percent return in 50 days from its minimum point. On the other hand, IDEA generates only 17.1 percent return in 50 days and takes very long gestation of 194 days to generate 50 percent return from its all time low value during the study period. It is interesting to see that MCDOWELL-N generates the minimum return in 50 days in the group but surprisingly takes only 26 days to provide 50 percent return from the minimum point. It is to be noted that NTPC price was lowest on 3<sup>rd</sup> March 2014 and hence we fall short of 50 days to calculate its return from the minimum point, but it has not generated 50 percent return till 31<sup>st</sup> March 2014, the end period of our study. The average stock in this category provides around 38 percent of return from their bottom to 50 days, there are stocks like BHARATFORG provides around 68 percent return (highest) and PETRONET provides almost 63 percent return. The average days to generate 50 percent return from the minimum point are only 54 with standard deviation of 68.5 days<sup>4</sup>. (See table 4(b) for the detail).

The analysis of category three, the high beta and high D-E ratio stocks are presented in table 4(c). The average stock takes about 50 days with standard deviation 36.2 to generate 50 percent return; and in 50 days from the bottom from the all time minimum during the study period these stocks generate around 65 percent return with standard deviation 44.8<sup>5</sup>. The LICHSGFIN performs very well with generating the highest return of almost 149 percent in the 50 days from the minimum. This stock also takes the lowest number of days (16 days) to quickly bounce back from the bottom and generates 50 percent return. This is followed by IDFC taking only 18 days to generate return of 50 percent from its bottom and also generates almost 130 percent return within 50 days. The BPCL provides 28.7 percent return in 50 days whereas it takes around 82 days to provide 50 percent return. The HINDPETRO provides low return of only 29.5 percent in 50 days and takes the highest time of 113 days to generate 50 percent return from its bottom. (See table 4(b) for the detail).

Among all the companies, LICHSGFIN from the third category takes lowest time (only 16 days) whereas IDEA from second category takes highest time (194 days) to recover from its bottom to provide 50 percent return. In 50 days from the bottom (relatively medium time period), TECHM from first category generates very high of 187.78 percent return whereas BOSCHLTD from first category generate only 6.53 percent

return. The table 4 shows that, average stock with high beta and high D-E ratio takes less time to recover from the bottom to generate 50 percent return even as compared to average stock from other two categories. We also find that from the bottom, in 50 days stocks with high beta and D-E ratio generate high average return followed by stocks with low beta and D-E ratio. This is not in the general line and needs thorough examination.

The financial services sector on an average generates 75 percent return in 50 days from the bottom and generates 50 percent return from the bottom in about 35 days. However, the range of return is very high spanning from 23.5 percent (UNIONBANK) to 148.7 percent (LICHSGFIN). While YESBANK takes only 10 days, M&MFIN takes 137 days to bounce back from the all time low value to offer 50 percent return.

## 6. Conclusion and Policy Implications

The fundamental law of investing is the uncertainty of the future. Stock prices express the collective expectations of investors, and changes in these expectations determine the investment success. We study the investment and trading strategies in the Indian stock market considering the selected companies of CNX-100. Our analysis for investment is to group the stocks with beta and debt-equity ratio. Following mean reversion principle without advocating for it, we develop the strategy for trading in the stock market.

We find that in the short run (one year) the average stocks with low beta and low debt-equity ratio provides roughly the same average return of the medium beta and medium debt-equity ratio; however it provides better return than the average stocks with high beta and high debt-equity ratio. The same trend is visualized in the long run (5 years) but the average stocks of first category generate very impressive return of around 16 percent based on 5 year CAGR followed by second category with 12.3 percent whereas stocks with high beta and high debt-equity ratio generates negative return of -0.31 percent. Remember that the 16 percent and 12.3 percent annual compound returns are tax free.

The financial services sector is usually with high beta but provides only 0.004 percent average return based on one year CAGR whereas in 5 year CAGR it generates 6.4 percent return. This shows that CAPM does not hold and establishes that stock with low beta generates high return over a period of both one year and 5 years. This is also the case for low beta stocks with low debt-equity ratio as compared to high beta stocks with high debt-equity ratio. There is further implication that emerges from our study that portfolio returns of the stock cannot be explained by only beta rather it is desirable to consider other factors, the debt-equity ratio is being an important one among them.

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## End Notes

<sup>1</sup> The 8 companies not considered are BAJAJFINSV, INFRATEL, COALINDIA, GLAXO, OIL, GSKCONS, BAJAJHLDNG and OFSS.

<sup>2</sup> The banking sector uses debt as a working capital requirement and tends to have a high debt component which is not a reflection on the operational efficiency of the banks. Thus, banks are taken as separate category.

<sup>3</sup> Following these three categories, we have 32 stocks are under consideration for analysis of investment and trading strategies. We have ignored the possibilities of other combinations of beta and debt-equity ratio. The financial services sector stocks are treated separately.

<sup>4</sup> However, it is important to note that when we exclude IDEA from the group, the standard deviation reduces to only 4.1 days.

<sup>5</sup> When we exclude only one stock, the HINDPETRO the standard deviation of days from the lowest to 50 percent return falls from 36 to 29. Whereas, the standard deviation of returns from the minimum to 50 days drastically falls to 16.1 percent when we remove only two stocks, the LICHSGFIN and IDFC.

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