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EMPIRICAL ANALYSIS ON STOCK RETURN AND VOLATILITY EVIDENCE WITH THE SPECIAL REFERENCE TO NSE

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ABSTRACT

The risk factor of investment leads the investors to judge their financial status. Investors who are ready to take high risk they can commonly invest in a stock market financial instrument to accomplish their financial goal. The goal of the investors is getting a good return for their investment. The Investors who are ready to take risk they measure the market profit level on the source of risk and return and based on this they can modify their investment. In this research risk is projected using beta of all Sectorial indices of NSE with respect to nifty and also the performance of different stock will be rank on the basis of sector and year wise. The study examines the volatility and the risk level of NIFTY50 by using Beta. By using the beta we can examine the NIFTY50 five sectors and also five years volatility and level of risk for that we can take returns of NIFTY50 and Sectorial indices, for the calculation of beta take the monthly average of return with the help of formula (slope, return on indices : return on NIFTY 50) we can get the beta. This study also deals in CAPM Model to analyses the level of risk , return & also volatility of stocks. The model describes the connection between systematic risk and expected return for stocks, particularly stocks.

Keywords: *Stock Return, Volatility, CAPM, NIFTY50, Financial Goal*.

Introduction

After liberliasation an analysis of stock market for the evaluation of the risk has considered to be important in India. Volatility of stock market creates confusion for investment decisions.[i] The research examines the volatility and the risk level of NIFTY50 by using Beta. For the research 5 sectors of NIFTY 50 has been taken and names are NIFTY Bank, NIFTY Financial Services, NIFTY FMCG, NIFTY IT, NIFTY Pharma.

The study also deals in CAPM Model to analyses the level of risk, return & also volatility of stocks. The model describes the connection between systematic risk and expected return for stocks, particularly stocks.[ii] Various methods and data description are also represented in this study with discussion on findings of the study. The last section of these paper summaries the findings

The study suggests various sectors to be invested to the investors on the basis of stock volatility and on their past performances. This research make an attempt made to understand the nature of volatility in the Indian Stock Market from the past daily stock return data of NSE.

Capital Asset Pricing Model

In finance, the capital asset pricing model is used to analyze the return of asset or stock and also this model describes the relationship between expected return and investment return.[iii] It clearly shows the level of risk in particular sector through beta and one can measure the return of market by using the closing price of stocks. This model gives result based on market risk and return by the way we can estimate the volatility.[iv]

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Review Literature

Yakob, beal and delpachitra(2005) find out the seasonal effects of ten asian pacific stock market, including the Indian stock market, for the purpose of learning seasonal assessment of stability and therefore ideal for examining seasonality. This study shows that Indian stock market exhibit a month-of-the-year effect in that statistically return is negative, it is found in the month of march and April whereas statistically gives the positive return were found in May, November gives the maximum positive return and also april generated the smallest negative returns.

krishnamurthy (2006) reveals that the competition, liquidity and volatility-in the stock market which is comparing to BSE and NSE. Result of the study shows that NSE has a much more effectiveness than the BSE. According to research the trading effectiveness is more on NSE when compared to BSE, also average size per trade is upper on the BSE.

Mahajan and singh (2008) examines the historical relationship between volume and return, and also volume and volatility by using data of daily average index of the BSE. Positive contemporary relationship between volume and volatility was observed in this study.

Pandian & Jeyanthi (2009) analyses the return and volatility and suggested the stock os BSE to invest and get reasonably high profits. Gupta (2011) compared the distribution of Indian stock marketplace with other Asian marketplace. The research covers whether Indian Stock market returns were correlated to the Asian economics or not The study covers BSE(India), HengSeng (Hong kong) , JKS (Indonesia), KLSE (malesia), NIkkIE (japan), KS11(Korea) in her look at. She used the descriptive information of the six asian market for the period between 2005 & 2009.Abdalla (2012) analyzed the stock return volatility in the Saudi stock market. Result supplied evidences that the existence of a positive risk premium, which supported the fine correlation hypothesis between volatility and expected return. Shanmugeshwara & Benedict (2013) performed an analysis on the volatility of the sectorial indices on the subject of NSE. The results of the study did not support any significant difference across the risk sectorial indices and NIFTY.

Bora & Adhikary (2015) conducted an empirical study on the risk-return relationship using selected BSE Sensex companies. The monthly closing prices of the 30 companies were used to examine the risk and return for the time between 2010&2013. The findings revealed positive relation between security returns and market returns and beats were found to be unstable.

Objectives of the Study

- To examine the relationship between returns and volatility of the national stock Exchange.
- To measure the risk of selected securities also measure the rate of return expected by the investors using CAPM model.
- To examine whether the asymmetric effect or leverage effect exist in the national stock Exchange

Scope of the Study

This study is an attempt to provide an empirical support to the risk and return factors across the Sectorial indices and CNX Nifty index. The findings from the study will of much interest both at academic and business level circle. An academic perspective the findings will be much and use to understand the risk and return relationship. From an investors point of view the findings also assist in identifying indices that generate a higher return for the given level of risk. For this study i consider the 5 years of data 5 different sectors from NIFTY bank, NIFTY FMCG, NIFTY IT, NIFTY pharma and NIFTY financial sevices

Research Methodology

The descriptive research design has been used for the study to describe the nature and extend of risk and return of Nifty sectoral indices with reference to CNX nifty.. Data has been sourced from reliable secondary sources (NSE website) for this study. Since the study is on analyzing the risk and return of Nifty fifty index. Thus, those indices, for which values were readily available of five sectoral indices. These include CNX Nifty FMCG, CNX financial services, CNX Nifty Bank, CNX Nifty IT. CNX Nifty Parma. The study covers a 5 year period from 2015 to 2020.To calculate the returns of the CNX NIFTY50 consider 5 years data of 5 sectors data has taken and made comparison between today's stock closing price and yesterday stock closing price and taking the monthly average of day to day return.

Further Scope

In this study, the factors that affect the stock return and volatility have been confined to internal variable only. No macro environment factors such as inflation. GDP has been factored in this study. Therefore future studies should aim by taking a long time series data and should incorporate macro-environment variables while determining the volatility.

Moreover the study has been confined only to CNX Nifty index and its sectoral indices. Thus, future studies should aim to analyze across multiple exchange that too operating in different geographic.

Data Analysis

Risk free rate to calculate CAPM: (Based on GOVT Bond)

Sl No.	Year	RF
1	15-16	7.726
2	16-17	6.930
3	17-18	6.965
4	18-19	7.708
5	19-20	6.631

Risk free rate, Market return and beta for calculation of CAPM: (NIFTY BANK)

Beta Calculations

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	0.50	0.63	0.65	0.57	0.67
2	May	0.67	0.73	0.53	0.64	0.76
3	June	0.69	0.65	0.54	0.72	0.76
4	July	0.72	0.58	0.55	0.56	0.63
5	August	0.72	0.64	0.79	0.61	0.65
6	September	0.61	0.67	0.79	0.63	0.59
7	October	0.51	0.67	0.34	0.92	0.44
8	November	0.67	0.63	0.68	0.74	0.44
9	December	0.77	0.81	0.87	0.95	0.67
10	January	0.69	0.50	0.68	0.79	0.66
11	February	0.70	0.58	0.72	0.69	0.92
12	March	0.60	0.71	0.72	0.61	0.82

Discussion

In 2016-2017 the lowest beta is .50 which shows that April month invest in banking stock is less volatile than market. In the same line 2019-2020, month of December shows the maximum volatility hat is .95 and October, 2018 shows the minimum beta that is .34 which represents Bank Nifty is very less volatile than index.

Return

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	-0.08	0.23	0.22	0.25	-0.10
2	May	0.12	0.22	0.22	0.25	0.25
3	June	-0.10	0.09	-0.04	-0.10	-0.04
4	July	0.11	0.28	0.37	0.24	-0.32
5	August	-0.40	0.20	-0.15	0.05	-0.25
6	September	0.04	-0.12	-0.05	-0.61	0.35
7	October	0.05	0.07	0.20	0.02	0.17
8	November	0.03	-0.21	0.06	0.33	0.31
9	December	-0.13	-0.11	0.04	0.06	0.03
10	January	-0.42	0.34	0.32	0.02	-0.18
11	February	-0.49	0.29	-0.45	-0.09	-0.27
12	March	0.74	0.18	-0.17	0.68	-2.01

Discussion

The market return is calculated on monthly average on stock return of Bank Nifty it shows equal negative as well as positive results, this mean the sector is better to invest and also investor gets good return but always there is a minimum risk.

CAPM

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	3.81	2.72	2.56	3.49	2.12
2	May	2.66	2.01	3.38	2.93	1.80
3	June	2.33	2.47	3.16	2.11	1.57
4	July	2.26	3.06	3.33	3.53	2.28
5	August	1.87	2.65	1.37	3.05	2.19
6	September	3.07	2.17	1.40	2.45	2.90
7	October	3.77	2.34	4.63	0.60	3.80
8	November	2.56	2.46	2.29	2.25	3.83
9	December	1.67	1.25	0.97	0.47	2.23
10	January	2.10	3.65	2.45	1.60	2.13
11	February	1.96	3.11	1.60	2.32	0.28
12	March	3.56	2.15	1.84	3.42	-0.48

Discussion

The results of CAPM calculation in the month of April 2016 has highest value 3.81 it is better to buy the stock has lesser risk and volatility compare to other months and also high return will be there for investors the market is less volatile. The lowest value of CAPM result is December, 2016 1.67 it has highest risk (BETA 0.77) and also market is more volatile there is no confirmation about the return on investment. In the same notion investor should invest where the beta is less and returns are high.

Risk free rate, Market return and beta for calculation of CAPM:NIFTY FINANCIAL SERVICES

Beta Calculations

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	0.60	0.74	0.70	0.61	0.77
2	May	0.70	0.78	0.67	0.71	0.77
3	June	0.69	0.74	0.53	0.79	0.79
4	July	0.75	0.58	0.36	0.49	0.59
5	August	0.76	0.70	0.81	0.62	0.63
6	September	0.67	0.78	0.88	0.58	0.65
7	October	0.53	0.62	0.56	0.80	0.55
8	November	0.74	0.83	0.66	0.77	0.62
9	December	0.83	0.92	0.85	0.85	0.83
10	January	-0.19	0.48	0.49	0.79	0.75
11	February	0.77	0.59	0.71	0.81	0.82
12	March	0.72	0.71	0.76	0.75	0.82

Discussion

In the above table the Risk Free rate is calculated as yearly average of GOVT Bond RF rate. The above Beta rates calculated on monthly average basis its shows the stock's volatility in relation to overall market. If the beta is 1 then that is same as market risk if it is less than 1 its shows low risk. In the above table represents the highest beta in the month of December 2018 is 0.83 this shows market is more volatile and lowest beta is -.19 in the month of January 2017 it shows less volatility in market.

Return

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	-0.11	0.13	0.16	0.20	0.03
2	May	0.11	0.31	0.22	0.19	0.33
3	June	-0.01	0.08	-0.01	0.06	0.03
4	July	0.11	0.35	0.38	0.27	-0.28
5	August	-0.42	0.18	-0.08	0.03	-0.10

6	September	0.05	-0.11	-0.07	-0.56	0.28
7	October	0.11	0.07	0.15	0.04	0.19
8	November	-0.06	-0.27	0.04	0.37	0.25
9	December	-0.03	-0.11	0.07	0.07	0.12
10	January	-0.44	0.32	0.04	-0.05	-0.07
11	February	-0.50	0.24	-0.39	-0.10	-0.26
12	March	0.61	0.24	-0.11	0.59	-1.61
						0.77

Discussion

The market return is calculated on monthly average on stock return of Financial Service Nifty it shows more negative results in the year 2016-17 and 2017-18, these years sector is not good to invest. On the contrary side 2020-21 more positive results which represents good time to invest

CAPM

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	3.06	1.93	2.23	3.09	1.53
2	May	2.39	1.74	2.43	2.38	1.76
3	June	2.42	1.83	3.27	1.69	1.41
4	July	1.99	3.11	4.60	4.06	2.52
5	August	1.51	2.18	1.29	2.96	2.41
6	September	2.61	1.44	0.77	2.95	2.47
7	October	3.70	2.64	3.13	1.61	3.09
8	November	1.92	0.92	2.38	2.03	2.69
9	December	1.32	0.42	1.08	1.23	1.21
10	January	9.29	3.78	3.54	1.62	1.63
11	February	1.38	2.98	1.70	1.39	1.00
12	March	2.56	2.19	1.56	2.35	-0.11
						8.06

Discussion

The results of CAPM calculation in the month of April 2016 has highest value 3.81 it is better to buy the stock has lesser risk and volatility compare to other months and also high return will be there for investors the market is less volatile. The lowest value of CAPM result is December, 2016 1.67 it has highest risk (BETA 0.77) and also market is more volatile there is no confirmation about the return on investment. In the same notion investor should invest where the beta is less and returns are high.

Risk free rate, Market return and beta for calculation of CAPM:NIFTY FMCG

Beta Calculations

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	0.45	0.75	0.34	0.27	0.72
2	May	0.91	0.55	0.23	0.32	0.87
3	June	0.54	0.55	0.16	0.61	0.82
4	July	0.54	0.25	0.18	0.25	0.69
5	August	0.99	0.31	0.63	0.40	0.95
6	September	0.64	0.72	0.63	0.41	0.96
7	October	0.38	0.83	0.36	0.83	0.75
8	November	0.40	0.67	0.65	0.57	0.60
9	December	0.44	0.57	0.63	0.86	0.81
10	January	0.77	0.16	0.42	0.65	0.72
11	February	0.98	0.36	0.91	0.59	1.03
12	March	0.53	0.38	0.80	0.46	1.09

Discussion

In the above table the Risk Free rate is calculated as yearly average of GOVT Bond RF rate. The above Beta rates calculated on monthly average basis its shows the stock's volatility in relation to overall market. If the beta is 1 then that is same as market risk if it is less than 1 its shows low risk. In the above table represents the highest beta in the month of March 2021is 1.09which shows that market is more volatile than market. Lowest beta is 0.16in the month of January 2018 it shows less volatility in market.

Return

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	-0.17	0.00	0.01	0.41	0.03
2	May	0.16	0.18	0.41	0.01	-0.07
3	June	0.02	0.24	0.17	0.03	-0.05
4	July	0.17	0.14	-0.16	0.31	-0.07
5	August	-0.18	0.08	0.02	0.29	0.04
6	September	-0.03	-0.24	-0.25	-0.55	0.34
7	October	0.05	-0.01	0.24	-0.19	0.19
8	November	0.05	-0.22	0.03	0.27	-0.21
9	December	-0.01	0.07	0.20	0.07	-0.13
10	January	-0.26	0.24	0.05	-0.10	0.10
11	February	-0.20	0.12	-0.12	-0.09	-0.24
12	March	0.39	0.24	-0.07	0.19	-0.55

Discussion

The market return is calculated on monthly average on stock return of FMCG Nifty it shows more negative results in the year 2016-17 and 2019-2021, these years sector is not good to invest.

CAPM

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	4.20	1.71	4.59	5.76	1.87
2	May	0.83	3.22	5.46	5.22	0.83
3	June	3.55	3.27	5.88	3.02	1.14
4	July	3.65	5.23	5.67	5.83	1.98
5	August	-0.09	4.81	2.56	4.76	0.37
6	September	2.74	1.74	2.43	4.36	0.59
7	October	4.81	1.19	4.52	1.18	1.80
8	November	4.64	2.13	2.48	3.49	2.49
9	December	4.30	3.00	2.69	1.13	1.17
10	January	1.54	5.87	4.03	2.66	1.91
11	February	-0.02	4.48	0.51	3.12	-0.47
12	March	3.83	4.38	1.33	4.28	-1.23

Discussion

CAPM results of October 2016 is highest that is 4.81 and beta for the same month 0.38 ,it can be a good preference to give good returns.in the same notion for 2020-2021 shows very low CAPM figure and high beta values which shows that it was not a good year to give invest, there would be no confirmation for returns.

Risk free rate, Market return and beta for calculation of CAPM:NIFTY IT

Beta Calculations

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	0.52	0.62	0.31	0.04	0.42
2	May	0.76	0.76	0.12	0.15	0.29
3	June	0.52	0.57	-0.01	0.31	0.60
4	July	0.31	0.22	0.21	0.03	0.31
5	August	0.69	0.21	0.46	0.19	0.40
6	September	0.87	-0.03	0.57	-0.03	-0.30
7	October	0.30	0.47	0.48	0.36	0.20
8	November	0.63	0.41	0.02	0.12	0.52
9	December	0.80	0.69	0.38	0.33	0.33
10	January	0.87	0.19	0.10	0.51	0.39
11	February	0.79	-0.02	0.34	0.42	0.58
12	March	0.81	0.46	0.38	0.24	0.61

Discussion

In the above table the Risk Free rate is calculated as yearly average of GOVT Bond RF rate. The above Beta rates calculated on monthly average basis its shows the stock's volatility in relation to overall market. If the beta is 1 then that is same as market risk if it is less than 1 its shows low risk. In the above table represents that the year 2019-2020 was the least volatile and year 2016-2017 was the most volatile period among the time period taken for the study. September 2016 and January 2017 was the most volatile month among through 5 years.

Return

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	-0.45	0.01	-0.37	0.49	0.30
2	May	0.26	0.08	0.27	-0.10	-0.15
3	June	-0.21	-0.11	-0.18	0.12	-0.07
4	July	0.22	-0.09	0.28	0.19	-0.08
5	August	0.02	-0.15	-0.09	0.39	0.13
6	September	0.19	-0.12	-0.04	0.01	-0.15
7	October	-0.23	-0.10	0.17	-0.26	0.02
8	November	-0.13	0.01	0.12	-0.09	-0.18
9	December	0.01	0.14	0.24	-0.06	0.21
10	January	0.01	-0.25	0.50	0.31	0.14
11	February	-0.41	0.43	-0.07	0.08	-0.29
12	March	0.49	0.01	-0.12	-0.03	-0.84

Discussion

The market return is calculated on monthly average on stock return of NIFTY IT, it shows that July 2019 has the least beta that is0.03 where as for the same month gives moderate return 0.13 .Overall by comparing the other sectors, IT is least volatile after pharmaceutical sector.

CAPM

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	3.46	2.63	4.66	7.42	3.97
2	May	2.02	1.73	6.15	6.55	4.66
3	June	3.61	2.88	7.04	5.38	2.62
4	July	5.41	5.38	5.54	7.45	4.57
5	August	2.42	5.45	3.70	6.35	4.00
6	September	1.13	7.12	2.94	7.93	8.67
7	October	5.33	3.59	3.72	4.81	5.30
8	November	2.74	4.12	6.84	6.77	3.11
9	December	1.58	2.26	4.42	5.17	4.53
10	January	0.98	5.60	6.32	3.95	4.08
11	February	1.33	7.05	4.57	4.52	2.64
12	March	1.85	3.75	4.28	5.87	2.05

Discussion

CAPM results of September 2020 is highest that is 8.67 and for the same month beta was very low that is -0.15which shows high return and with less volatility in the September 2020. January 2017 shows the least CAPM value of 0.98.

Risk free rate, Market return and beta for calculation of CAPM:NIFTY Pharma

Beta Calculations

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	0.24	0.98	0.18	0.36	0.37
2	May	0.82	0.46	0.03	0.24	0.46
3	June	0.42	0.31	0.00	0.17	0.48
4	July	0.30	0.27	0.11	0.25	0.34
5	August	0.70	0.55	0.27	0.04	0.31
6	September	0.83	0.58	0.23	0.44	0.77

7	October	0.32	0.70	0.12	0.55	0.37
8	November	0.38	0.30	0.19	0.08	0.30
9	December	0.44	0.55	0.37	0.44	0.53
10	January	0.69	0.44	0.27	0.24	0.37
11	February	0.59	0.16	0.33	0.22	0.66
12	March	0.49	0.40	0.78	0.40	-0.44

Discussion

Year 2018-2019 was the least volatile year and 2016-2017 was the most volatile year in the last 5 years. April 2017 shows the highest volatility with beta 0.98.

Return

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	-0.46	0.15	-0.22	0.25	0.02
2	May	0.19	-0.12	-0.51	-0.43	-0.48
3	June	-0.10	0.06	0.30	0.53	-0.24
4	July	0.07	0.25	-0.06	0.01	-0.03
5	August	0.34	-0.08	-0.31	0.60	0.13
6	September	-0.11	-0.01	0.18	-0.21	-0.35
7	October	0.10	0.08	0.31	-0.08	0.22
8	November	-0.71	-0.22	-0.24	-0.25	0.20
9	December	0.19	-0.34	0.21	-0.22	-0.09
10	January	-0.08	-0.01	-0.11	-0.01	0.06
11	February	-0.23	0.18	-0.23	0.04	-0.34
12	March	-0.11	-0.08	-0.32	0.27	-0.17

Discussion

The market return is calculated on monthly average on stock return of NIFTY Pharma, During the period of study the Nifty Pharma shown the moderate returns.

CAPM

Sl No.	Month	2016-2017	2017 -2018	2018 - 2019	2019 - 2020	2020-2021
1	April	5.74	0.32	5.69	5.01	4.21
2	May	1.56	3.66	6.73	5.77	3.40
3	June	4.45	4.82	6.95	6.45	3.33
4	July	5.42	5.13	6.16	5.81	4.37
5	August	2.52	3.05	4.97	7.40	4.60
6	September	1.19	2.88	5.40	4.19	1.27
7	October	5.31	2.12	6.18	3.38	4.27
8	November	4.52	4.75	5.60	7.07	4.70
9	December	4.39	2.92	4.47	4.22	3.04
10	January	2.34	3.88	5.04	5.83	4.18
11	February	3.06	5.85	4.60	6.03	2.01
12	March	3.89	4.15	1.29	4.76	9.65

Discussion

CAPM results of April 2017 shows the least value that is 0.32 and for the same month return is 0.15 and beta is .98 that is highest among all months of last 5 years. This represents that retuen was less as compared to risk.

Findings

The findings are given below,

- Every sector has positive as well as negative return and it shows the soundness of the sector. In the NIFTY Bank, NIFTY Financial service, NIFTY FMCG these sectors has more positive return it shows the soundness of the sector so investor can invest in the sector and get a good return, compare to NIFTY IT and NIFTY Pharma.

- Based on the level of risk(beta) investors can forecast their future return. The NIFTY IT, NIFTY pharma has less risk and also low level of volatility compare to other three sector, In the other words, it can be stated that the return generated from these two sector can be more consistent.
- The NIFTY bank, NIFTY financial services and NIFTY FMCG sectors has high level risk the value of beta is more compare to other two sector. So the level of risk is very high Investors who are ready to takes risk they can invest in these sectors.

Conclusion

Among all the indices NIFTY bank, NIFTY financial services and NIFTY FMCG was the 3 sectors that had good return during entire period. The NIFTY IT, NIFTY pharma has less risk and also low level of volatility compare to other three sector, In the other words, it can be stated that the return generated from these two sector can be more consistent. This shows the investor can make positive return and also negative return from given level of risk. Risk averse can easily adopt other three sector. The NIFTY bank, NIFTY financial services and NIFTY FMCG sectors has high level risk the value of beta is more compare to other two sector. So the level of risk is very high Investors who are ready to takes risk they can invest.

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