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Fundamental Analysis and Descriptive Statistics of Share Price For Investment Decisions

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Abstract:

Trading, gambling, and investing all involve risk and chance to some extent. But they differ from one another. Even though stock trading is subject to the vagaries of the market, it is based on a database of financial data which serves as a backbone for both traders and investors. It is not incorrect to compare uninformed investing to gambling. Investors must have a solid understanding of the company's fundamentals because doing so makes it easier to distinguish between good and bad stocks. The purpose of the study is to evaluate a company's fundamentals and quantify how closely they relate to the share price using descriptive statistics. The study discusses all crucial ratios, including the 10 crucial ratios known as F_Decile (solvency ratios, profitability ratios, valuation ratios, debt ratios, and efficiency ratios). To assess the degree of correlation between the company's fundamentals and changes in the share price, the F_Decile score is correlated with the change in share price determined on a daily basis from 2017–18 to 2021–22. The research's findings also assist traders and investors in differentiating between companies with the potential to generate abnormal profits and those with meagre or non-existent returns over time. In order to forecast the future share price for investment purposes, descriptive statistics such as range, sum, mean, and standard deviation are applied to the fluctuating share price on a daily basis. These statistics help to determine the movement and magnitude of the share price over a period of five years.

Keywords: Abnormal profits, Correlation, Investing, Trading, F_Decile

INTRODUCTION

Trading and investing don't have to be like gambling, which is a zero-sum game. Burton Malkiel put forth the Random Walk Theory in his 1973 book 'A Random Walk Down Wall Street'. The idea was supported by the notion that the stock market fluctuates erratically. The theory opposed the use of any information or analysis prior to investing. The reasoning runs counter to the fundamental assumption of the stock market, which was created to allow investors to make investments in companies with promising futures and high rates of return, which would be reflected in rising share values. Investors who believe a company's earnings will rise in the long run or who believe a stock is undervalued may be willing to pay a higher price for stock in advance, regardless of the company's current financial status. The investor relies on the information generated from the company's financial reports. Fundamental analysis is a tool that assists an investor in analyzing a company's future profitability based on its business environment and financial performance to access its future growth and profit potential. The research focuses on the degree of relationship between fundamental factors and share price.

For any investor, understanding the top-down strategy which includes the economy, industry and company adopted by Mr. Suresh A. S. (2013) and Bassam A. Elbially (2019) and how it affects the share price is crucial. For ordinary investors, however, keeping track of the economy, industry, and company is a laborious task. It is important to remember that there is always some broad knowledge about the business world and economy available. The financial health of a company can be precisely determined through fundamental analysis. A more thorough understanding of a company's future prospects can be obtained by using numerous ratios and comparing them with the performance of the prior years. The study's primary objective is to evaluate the company's financial health using ratios of profitability, solvency, value, efficiency, and debt.

LITERATURE REVIEW

Benjamin Graham and David Dodd (1934) pioneered fundamental analysis by incorporating macroeconomic and microeconomic analysis. Thus, fundamental analysis extends beyond corporate financial data to include macroeconomic data.

Ball and Brown's (1968) analysis of accounting data, notably the change in net income and its effect on stock prices, was explored by G.P. Kourtis, E.P. Kourtis, M.P. Kourtis, and P.G. Curtis (2017) The Efficient Market Hypothesis, which claims that any information made available to the public is useless for earning anomalous profits, is challenged by the author.

Bettman, (2000) when utilized concurrently to comprehend the fundamentals of a company, the author's F_score, which contains nine fundamental elements, is a beneficial tool for gaining an advantage over other investors in terms of attaining better returns and reducing risks.

In his essay "In Defence of Fundamental Analysis" (2005), Frank Shostak claims that the stock market does not have a life of its own. In the majority of cases, the success or failure of the firm itself will ultimately determine whether stock investing is successful or unsuccessful. Because of this, the author formulated a hypothesis to examine how the company's fundamentals affect the share price. The claim that fundamental research cannot significantly improve the performance of a portfolio of Baltic company stock was proven to be false. The results of the study showed that neither of the ratios suggested contributed in the creation of a portfolio whose performance would surpass that of the market. The sole exception was the price to earnings ratio, which demonstrated that investors seem to prefer investing in inexpensive companies. Equity investors largely ignored the financial status of the company (profitability, stability of balance sheets), concentrating instead on evaluating their growth prospects and business model appeal. So, while choosing a company,

investors tended to be prospective. As a result, businesses with little room for expansion or complete business model erosion suffered greatly in terms of performance.

According to Staffan Bülow's data from (2017), a portfolio with a high F-score earned 18.3% yearly, whereas a portfolio with a low F_score earned 4% annually. This means that fundamental analysis can be utilised to distinguish between winning and losing stocks. Additionally, the author emphasised the behavioural finance perspective. He asserts that investors frequently place an undue emphasis on past results. When investors combine value equities' low historical performance with their overemphasis on the past, they take on a negative outlook. Investors often appreciate good firms and focus on their past performance, which creates an overly gloomy and too optimistic viewpoint. Value stocks are neglected, and only if exploited by a fundamental strategy like f-score, it will give the correct picture rather than a behavioural outlook in an unbiased way.

Symon Kibet Kiprop and Joseph Kurwo Chelimo (2017) Establishing the impact of dividend policy on the share price performance of listed insurance firms at NSE Kenya was the study's main goal. As a result of these findings, the study draws the conclusion that management's dividend policy decisions have an impact on the share price since they cause stock prices to fluctuate. Since the majority of NSE investors base their bets on quick profits.

RESEARCH METHOD

The research methods comprise tools for data collection, calculation of fundamental score, calculation of change in share price daily and descriptive statistics.

DATA COLLECTION

Secondary data was collected from the company websites and the financial data providing sites like Morning Star and Yahoo Finance.

Sample Selection

The sample was chosen through convenience sampling. Different Nifty 50 sectors were chosen because investors prioritise the Nifty 50 based on its market capitalisation when making investment selections. There are a total of nine companies, which represent the FMCG, construction materials, and automobile industries. Secondary data was collected over five years, from 2017-18 to 2021-22.

DATA ANALYSIS

Financial Performance Signal

Finding the degree of correlation between the fundamental factors and change in the share price is the major goal of the study. The Piotroski score, which was developed by Joseph Piotroski in 2000 utilised nine fundamental signals encompassing an organization's profitability, leverage, and operational efficiency, and served as the foundation for my study of fundamental analysis. Along with the aforementioned three domains, my study also focused on valuation and debt ratios. F_Decile is used in place of F_Score to show the analysis of the financial position of the company using ten key ratios. The ten ratios included changes in **valuation ratios** such as price-to-earnings ratio, price-to-book-value ratio, dividend yield ratio, **profitability ratios** such as earnings per share and net profit margin ratios, **solvency ratios** such as current ratio, **debt ratio** such as debt-equity ratio and interest coverage ratio, and **efficiency ratio** such as total asset turnover ratio and inventory turnover ratio.

Calculation Of Fundamental Score

The calculation method of Piotroski is applied. For Dividend Yield, Return on Equity, Net Profit Margin, Current Ratio, Inventory Turnover Ratio, Total Asset Turnover Ratio, and Interest Coverage Ratio, every increase in the ratio on a yearly basis plus 1, and a decrease in the ratio is 0. Similarly for the Price to Earnings Ratio, Price to Book Ratio and Debt Equity Ratio, every decrease in ratio plus 1 otherwise 0. The table 1 given below is an example of the calculation of the F_Decile score.

Table 1: Fundamental Score (F_Decile) of UltraTech Cement Ltd.

Company Name		PE	PB	Div. Yield	ROE	NPM	C.R.	I.T.R	TA.T.R.	D/E	Int.Coverage	F-Decile
UltraTech Cement Ltd.	2018	57.34	4.04	0.26	8.75	7.17	1.01	2.46	0.62	0.6	3.71	4
Industry	2019	33.65	3.32	0.28	8.89	6.62	0.91	2.47	0.6	0.69	3.29	5
Construction Materials	2020	27	3.74	0.25	17.23	14.02	0.86	2.19	0.58	0.47	3.73	5
	2021	34.36	4.75	0.49	13.12	12.35	1.13	2.28	0.53	0.33	6.26	5
	2022	30.85	3.9	0.55	15.53	14.2	0.87	2.25	0.61	0.12	10.44	8

Source: morning star.com

Calculation Of Share Price

The change in share price is calculated using the closing price every day for five years, from 1 April 2017 to 31 March 2022. Descriptive statistical tools are applied, such as range, sum, average, and standard deviation on the changed share price.

Statistical Tools Used

The various descriptive statistics tools employed in my study have various functions. The spread of the share price change over a year was displayed by the range between the lowest and highest value. The sum of the altered prices revealed whether the share price was more likely to move downward or upward. The stock has moved downward if the sum is negative. The mean represents the full value to determine the association of share price with fundamental elements. The standard deviation illustrates the prices' variation from their mean, which when compared with the sum represents the positive or negative deviation and the degree of deviation.

ANALYSIS & INTERPRETATION

Descriptive Statistics for Construction Materials Sector

Descriptive statistics for the companies in the Construction materials Sector was used. Major players like Grasim Industries Ltd., Larson and Toubro Ltd., Ultra Tech Cement were considered for the analysis.

Table 2: Descriptive Statistics of Construction materials Sector

Descriptive Statistics (Constructional Materials Sector)					
(Grasim Industries Ltd.)					
Year	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{\text{Stdv.}}$	ΔF_{Decile}
2018	323.05	1.90	0.0077	25.37072	3
2019	408.50	-192.95	-0.7749	24.74786	5
2020	157.50	-381.85	-1.5460	19.25580	5
2021	139.65	974.45	3.9135	17.38546	4
2022	202.55	213.45	0.8607	29.21374	8
Pearson Correlation- ΔF_{Decile}	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{\text{Stdv.}}$	
	-0.206	-0.086	-0.085	0.542	
Sig.(2-tailed)	0.740	0.891	0.892	0.346	
(Larson & Toubro Ltd.)					
Year	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{\text{Stdv.}}$	ΔF_{Decile}
2018	650.55	-264.00	-1.0732	40.65336	6
2019	123.95	74.40	0.3000	17.89098	8

2020	257.65	-576.80	-2.3352	26.99034	4
2021	178.10	610.40	2.4514	22.10276	5
2022	235.85	348.75	1.4006	28.12341	6
Pearson Correlation- ΔF_{Decile}	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{Stdv.}$	
	-0.126	0.260	0.262	-0.258	
Sig.(2- tailed)	0.840	0.672	0.670	0.675	
(Ultra Tech Cement Ltd.)					
Year	P_Range	P_Sum	P_Mean	P_Stdv.	F_Decile
2018	445.15	-34.75	-0.1413	57.10676	4
2019	425.50	-4.50	-0.0181	66.32853	5
2020	926.80	-753.50	-3.0506	92.21670	5
2021	692.25	3493.10	14.0285	91.83279	5
2022	751.90	-169.95	-0.6825	115.45923	8
Pearson Correlation- ΔF_{Decile}	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{Stdv.}$	
	0.398	-0.144	-0.144	0.853	
Sig.(2-tailed)	0.507	0.817	0.817	0.066	

Source: NSE Website

The fundamental scores of Grasim and Ultra Tech Ltd. have increased in the above table, and L&T is also showing a positive trajectory beyond 2020. While the range of Ultratech Cement's share price changes reveals a positive, albeit weak, link, the range of L&T and Grasim's share price changes shows a negative relationship with F_Decile. The sum of the absolute number and mean, which represents the daily change and decline in share price, also reveals a negative correlation for Ultratech and Grasim and a positive relationship for L&T, or 0.260 and 0.262, respectively. Given that the share price has not increased in accordance with the strengthening fundamentals, the standard deviations of Ultratech Cement and Grasim

Ltd. both have the potential to generate abnormal profits in the future. It is questionable whether the share price of L&T will increase in the future due to the negative range and standard deviation.

Descriptive Statistics for Auto and Automobile Sector

Indian Auto and automobile sector has been of the sectors that is growing with faster pace. Given below is the descriptive statistical analysis for the some well-known companies in Auto and Automobile sector:

Table 3: Descriptive statistics (Auto and Automobile sector)

Descriptive Statistics (Auto and Automobile sector)					
(Mahindra & Mahindra Ltd.)					
Year	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{\text{Stdv.}}$	ΔF_{Decile}
2018	855.40	-548.00	-2.2276	53.14909	9
2019	322.05	-65.00	-0.2590	20.31715	2
2020	90.30	-388.95	-1.5747	11.96266	1
2021	121.10	510.30	2.0494	16.03887	5
2022	219.80	11.30	0.0452	18.05433	7
Pearson Correlation- ΔF_{Decile}	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{\text{Stdv.}}$	
	0.684	-0.094	-0.097	0.736	
Sig.(2-tailed)	0.203	0.881	0.877	0.157	
(Bajaj Auto Ltd.)					
Year	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{\text{Stdv.}}$	ΔF_{Decile}
2018	283.45	-60.75	-0.2470	36.62555	6
2019	421.65	166.40	0.6710	44.75318	4

2020	497.15	-888.75	-3.5982	51.18516	6
2021	573.30	1648.25	6.6195	62.22601	5
2022	360.85	-37.55	-0.1520	52.97501	4
Pearson Correlation- ΔF_{Decile}	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{Stdv.}$	
	-0.004	-0.292	-0.294	-0.260	
Sig.(2-tailed)	0.995	0.633	0.631	0.673	
(Maruti Suzuki India Ltd.)					
Year	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{Stdv.}$	ΔF_{Decile}
2018	903.65	2845.40	11.5667	95.93496	6
2019	950.90	-1959.15	-7.9640	124.54624	6
2020	1479.05	-2384.25	-9.6528	152.42924	2
2021	1101.05	2570.90	10.3249	141.62586	4
2022	1214.80	702.10	2.8197	149.21476	5
Pearson Correlation- ΔF_{Decile}	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{Stdv.}$	
	-0.921	0.376	0.377	-0.726	
Sig.(2-tailed)	0.026	0.533	0.532	0.165	

In the above table, the fundamental score is not very attractive, it has declined for all three companies from 2018 to 2022, though it showed little improvement in Maruti Suzuki and M & M 2021 onwards. There is a strong negative correlation between the range and standard deviation of change in share price and fundamental factors of Maruti Suzuki. The relationship between range, mean, sum and standard deviation with the fundamental score of Bajaj Auto are negatively correlated which raises a question on the reliability of the fundamentals of a company for forecasting the future share price. The range and standard deviation of M & M are strongly related to the fundamentals and mean and sum are negatively related but very negligible thus indicating further query before investing. The above figure points out that the fundamentals of a

company and the change in share price are not very strongly correlated both fundamental score and descriptive statistics can help in determining the future trend of the share price when analysed separately.

Descriptive Statistics (FMCG Sector)

Another sector considered for the analysis was the FMCG sector as it has been considered as one of the critical sectors in the Indian economy. Table 3 provides the descriptive analysis of few companies of FMCG sector.

Table 4: Descriptive Statistics (FMCG sector)

Descriptive Statistics (FMCG Sector)					
(Hindustan Unilever Ltd.)					
Year	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{\text{Stdv.}}$	ΔF_{Decile}
2018	75.20	421.60	1.7138	13.23427	4
2019	152.60	363.95	1.4616	22.37076	9
2020	395.40	591.70	2.3955	36.19138	4
2021	409.65	133.00	0.5341	38.19785	5
2022	240.55	-385.10	-1.5591	30.84918	5
Pearson Correlation- ΔF_{Decile}	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{\text{Stdv.}}$	
	-0.303	-0.002	-0.006	0.760	
Sig.(2-tailed)	0.621	0.997	0.992	0.800	
(ITC Ltd.)					
Year	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{\text{Stdv.}}$	ΔF_{Decile}
2018	59.45	-24.80	-0.1008	4.65119	6
2019	75.35	41.75	0.1670	5.12175	8

2020	86.95	-125.55	-0.5063	5.88812	7
2021	24.75	46.80	0.1880	3.70774	3
2022	40.50	32.15	0.1291	3.92372	5
Pearson Correlation- ΔF_{Decile}	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{Stdv.}$	
	0.928	-0.394	-0.395	0.838	
Sig.(2-tailed)	0.023	0.512	0.511	0.076	
(Nestle India Ltd.)					
Year	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{Stdv.}$	ΔF_{Decile}
2018	657.60	1522.90	6.1907	82.07289	8
2019	1130.65	2686.90	10.8781	167.52055	4
2020	2226.05	5339.65	21.6180	245.12073	3
2021	2883.60	864.60	3.4723	289.71415	3
2022	1189.10	215.35	0.8683	207.86904	8
Pearson Correlation- ΔF_{Decile}	ΔP_{Range}	ΔP_{Sum}	ΔP_{Mean}	$\Delta P_{Stdv.}$	
	-0.788	-0.575	-0.574	-0.690	
Sig.(2-tailed)	0.113	0.310	0.312	0.197	

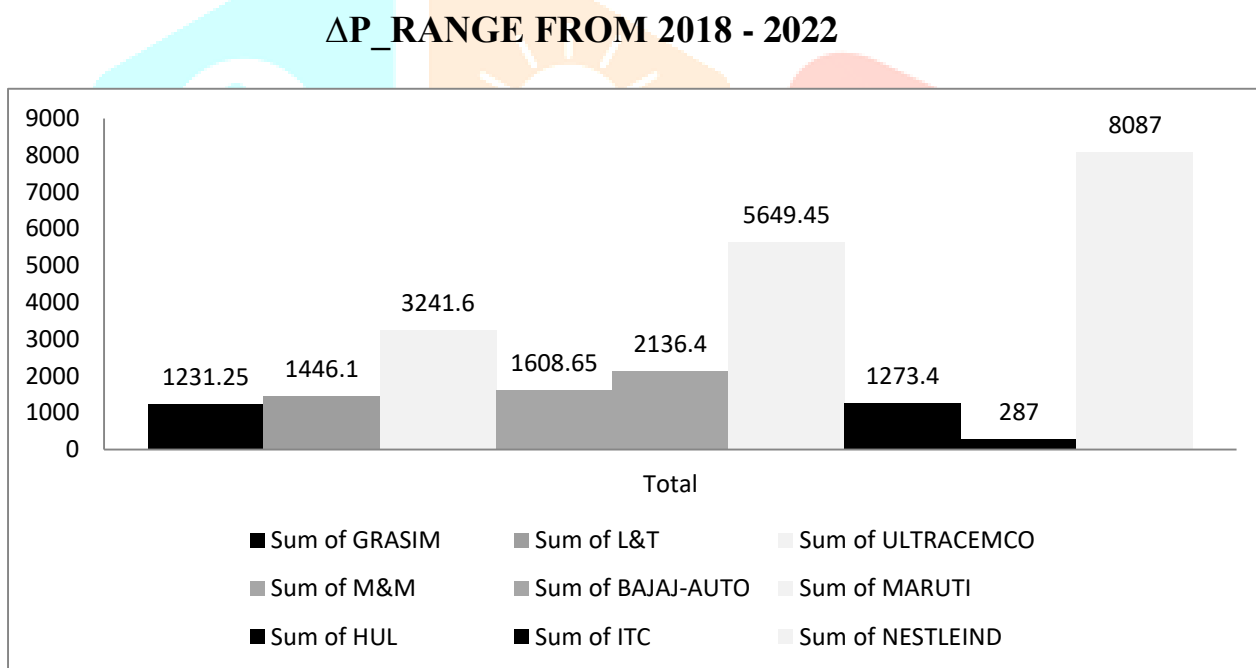
The fundamental score in the preceding table is not changing in any specific way. ITC Ltd.'s F_{Decile} indicates a decline in its F_{Decile} , the range is highly correlated and also indicates a decline, and the sum and mean are negatively correlated, indicating that the price increase does not correspond to the company's fundamentals. The fundamental score for Nestle Limited is not very encouraging, but it has increased in 2022. However, range, sum, and mean are not improving at the same rate as fundamentals. With 5339.65 and 21.6180 as the sum and mean, the F_{Decile} was at its lowest point at 3. Similar results to those of Nestle were also demonstrated by HUL, raising concerns about the use of fundamental indicators because the mean and sum are high while the fundamental score is low.

FINDINGS

The fundamental indicators provide insight into a company's future potential. The rising trend in the fundamental indices of organisations such as Grasim Industries Ltd. and Ultratech Cement Ltd. increases the dependability of investment. Similarly, companies such as Maruti Suzuki Ltd, Nestle India Ltd, L & T Ltd, and M & M Ltd have shown an increase in their fundamentals from 2019-2020 to 2021-2022, indicating strong prospects in the future. The decline in Bajaj Auto Ltd.'s fundamentals necessitate a closer examination of the company's operations and future intentions before investing.

The range and standard deviation are useful indicators for short-term traders and those interested in short selling though it is not free from risk. High abnormal profit is always accompanied by high risk. The mean and the sum of the changed share price help long-term investors by giving information about the extent of change in the share price from 2017-18 to 2021-22.

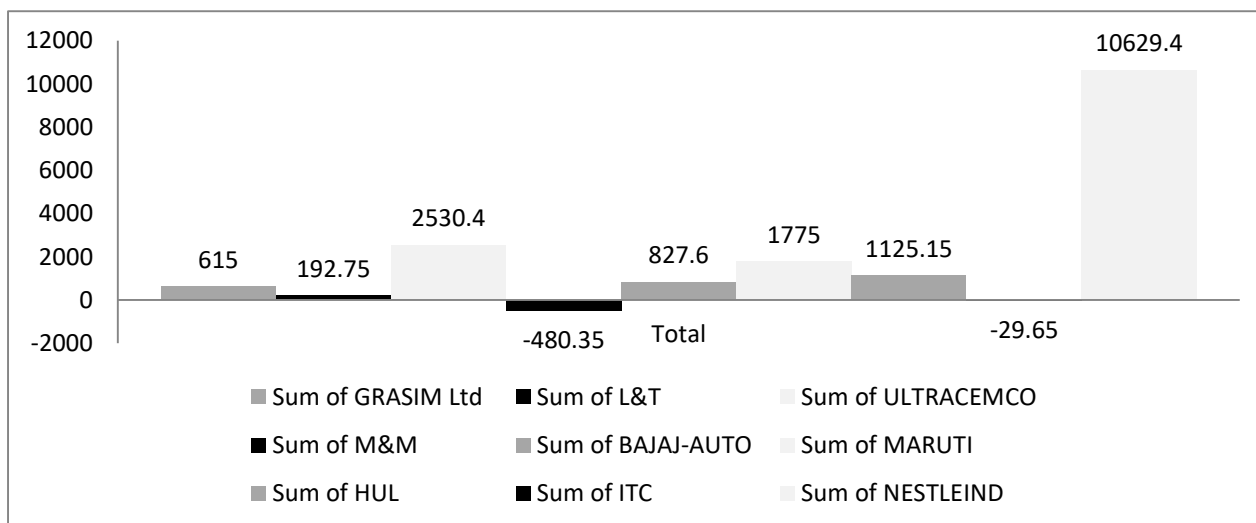
Figure 1: Range of companies from 2018-2022



The range of Nestle, Maruti and Ultratech Cement has increased by 3241.6, 5649.45 and 8087 respectively. It sends a green signal to short-term investors who are well-versed in trading, signalling good trading profits. The aforementioned number is an absolute value that takes both price increase and price decrease into account while ignoring the market price per share of different companies in the study. The question of why Grasim, ITC, and Hindustan Unilever will have the smallest range calls for additional investigation of the businesses to clarify the situation.

Figure 2: Changes in share price of companies from 2018-2022

ΔP_SUM FROM 2018 - 2022



In contrast to Range, Ultratech Cement has better positive returns of 2530.5 compared to Maruti Suzuki, with practically identical per share price. This means that Ultratech Cement would provide better returns for traders and investors who are looking to make short-term investments. The leader is still Nestle. Based on its price per share and potential for strong gains, Grasim & Hindustan Unilever also provides a favourable indicator for trading as middle-range equities.

Figure 3: Mean of FMCG companies from 2018-2022

ΔP_MEAN FROM 2018 - 2022

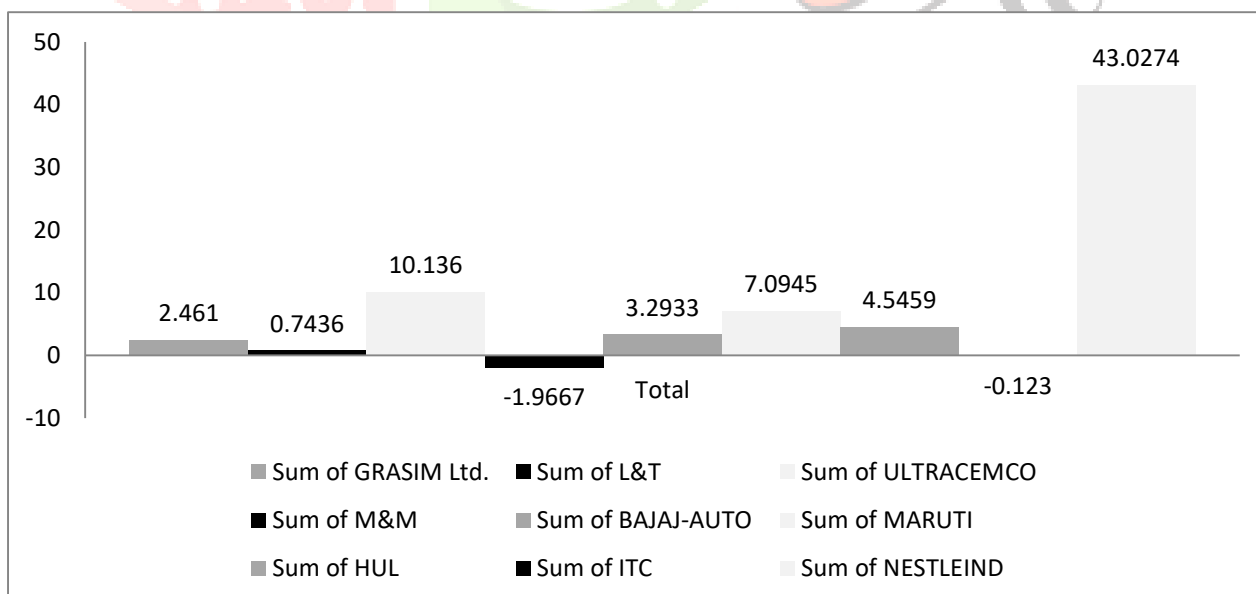
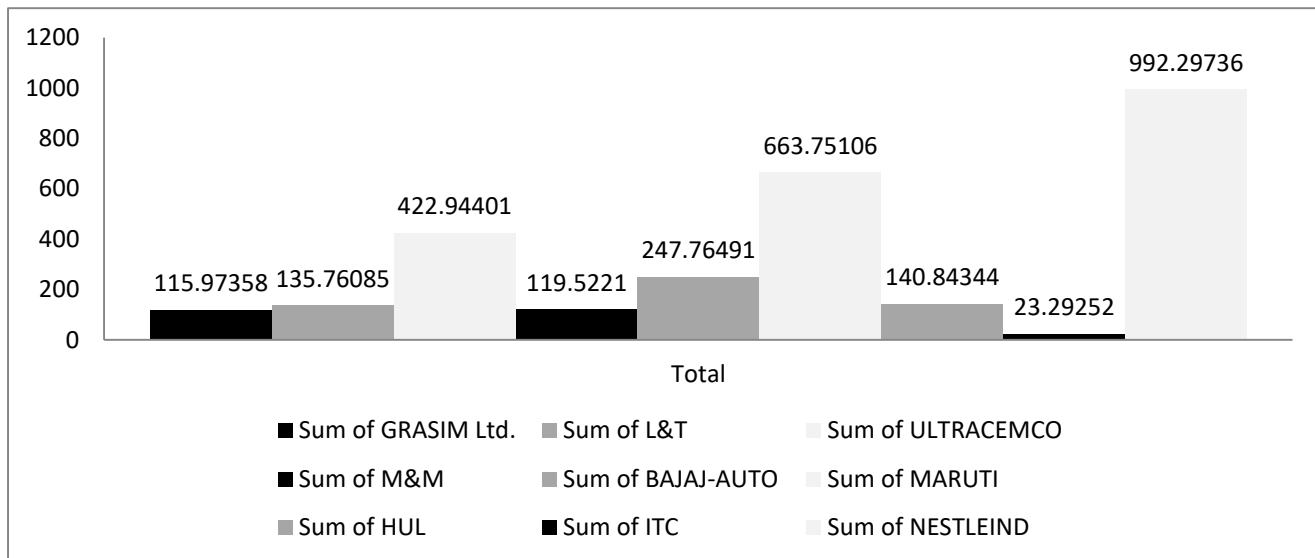


Figure 4: Standard Deviation of FMCG companies from 2018-2022

 $\Delta P_STDV.$ FROM 2018 - 2022

The standard deviation indicates the deviation of the data from the mean. The chances to earn an abnormal profit increase with the size of the deviation of the data from its mean. For short-term dealers and sellers, it is better. Maruti's shares have shown a declining trend from 2018 till 2020 and an improvement in its fundamentals thereafter also the sum and mean is not as good as Ultratech but its range and standard deviation are high, so short-term traders should keep an eye on Maruti's shares. Ultratech cement's standard deviation is lesser than Maruti's, but its sum and mean are larger which gives a better prospect for earning in the long term. With the range and standard deviation in the grey, Bajaj Auto and Hindustan Unilever are providing an indicator that more investing research is required before investing. Nestle is a winner with high range, sum, mean and standard deviation and the fundamental score in 2021-22 has also improved to 8 out of 10 thus worth tracking for long-term investment.

Limitations

1. The study is conducted on a few industries.
2. For descriptive statistics, variation in market price per share of different companies has been omitted which can affect the interpretation.

CONCLUSION:

The study concludes that there is very little to no correlation between F_Decile and market price movement calculated using descriptive statistics, but when both F_Decile and Statistics are examined separately, they provide information about the past performances and potential of the companies. The study emphasises the fact that trading or investing only based on a company's fundamentals would not produce the desired profits, and potential investors should therefore conduct additional research before making an investment. Investors examine a variety of technical analysis techniques as a result of the descriptive statistics of the change in share price, which also provide indications about share price fluctuations.

The fact that the strong fundamental of a company is a prerequisite that cannot be ignored thus the F_Decile used in the study is a very helpful tool for traders and investors to select the least risky company and

safeguard their investments. The study has left room for further research into the technical and statistical analysis and the degree of relationship between them to determine the future change in the share price.

The study also included some statistical analysis of how market prices fluctuate daily. The range made it easier to understand how the share price fluctuated annually. The sum and mean assisted in identifying the share that has the most potential to generate abnormal returns, and the standard deviation assisted in identifying the degree of price variation. The more deviation there is in the changing share price, the higher the earnings will be, particularly for short-term profit booking. Descriptive statistics are thus a helpful tool to gauge how the share price has changed.

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