CONSTRUCTION OF PORTFOLIO USING SHARPE INDEX MODEL WITH REFERENCE TO FMCG INDUSTRY IN INDIA

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Abstract: *Today the avenues for investment are abundant like bank deposits, property, insurance, shares etc. but taking an investment decision has become more critical. The risk associated with every investment option and evaluating the return out of that investment becomes very crucial. The 'risk and return analysis relevant in this circumstance. We are using sharpe index model for the risk and return calculation and portfolio construction. Sharpe's single index model is based on the assumption that stocks vary together because of the common movement in the stock market and there are no effects beyond the market. We have selected nine companies from FMCGS industry which plays an important role in propelling Indian growth engine. The stock prices were taken from the S&P CNX Nifty the stock price for the period 2004-2009. The main objectives are to calculate the beta and variance to help the investors to arrive at a decision of investing in the shares which offer maximum return with minimum risk and also to gain knowledge of the stock market. The findings and suggestion certainly would be helpful to investors.*

Key Words : *FMCG, Portfolio, Sharpe Index Model, Systematic risk, Unsystematic risk.*

Back ground of study:-

Fast moving consumer goods are those consumables which are normally consumed by consumers at regular interval which are sold quickly at relatively low cost. Though the absolute profit made on FMCG products is relatively small, they generally sell in large quantities, so the cumulative profit on such products can be large and resulted in large amount of money circulation. The competition among the FMCG manufacturers is also growing which attracts the investors towards the industry. Investment in FMCG industry is also increasing, specifically in India

FMCG sector is the fourth largest sector with total market size of US $ 13.1 billion. Increase in the world's population, low operational cost, solid distribution networks and the emergence of new FMCG companies made the industry so competitive. FMCG market has been exhibiting more than 10 percent growth since 2005 and is expected to grow at a CAGR(Compound annual growth rate) of 10 – 12 percent over the next few years. CAGR is used to find the year over year growth rate of an investment over a period of time. CAGR isn't the actual return in reality. It's an imaginary number that describes the rate at which an investment would have grown if it grew at a steady rate. CAGR is expected to be 9%.Therefore there is a need to conduct a research in this sector for investors benefits.

Statement of the problem

Fast Moving Consumer Goods Industry is one of the fastest growing sectors in the Economy. The rate of growth was remarkable despite the recession and investments in this sector would prove fruitful in the long run. This is the ultimate purpose of selection of this sector. Further, to construct the portfolio, there is a need to study the risk and return of the companies. This has paved way to select ten industries through probability sampling and then calculate the risk and return in order to construct a portfolio for all kinds of investors whether they prefer high risk, low risk or medium risk, the best companies to invest out of the companies taken for the study.

Objectives

The main objective of this research paper is to analyze the variability of returns associated with the security in a formal manner, to understand the role of beta and standard deviation in measuring the relevant risk of security, to know the proportions to invest in each security, through sharp index model, to construct a portfolio, out of all the securities analyzed.

Theoretical frame work

Hyman, Leonard s., Egan Joseph M(1980), The author explains that the market price of common

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stock for utilities is significant because: 1. It is sometimes considered by utility commissions in determining the allowed rate of return. 2. Utilities are more dependent than other businesses on stock offerings as a source of funds. Generally, in the period before 1965 utility stocks were profitable investments. United States Banker,(1989), This article describes the regard to the new risk-based capital requirements, asset-liability professionals should be aware that the amount of capital required under the official system undoubtedly will differ from the amount the bank might need if the asset-liability manager were to calculate the bank's economic risk. Coyne, Thomas Joseph (1982), His study prohibited from paying or receiving the profits realized by each of the 7 largest investor-owned electric utilities in the state of Ohio during the 1970s with results from firms in the oil industry, commercial banks, savings and loan associations, and large trucking companies. It was concluded that financial returns to equity of the utilities were equal to or greater than other firms..Sangeetha D, Mishra and Dheeraj Misra, This study aims at analyzing risk and returns of different sectors of the Indian economy using both the market and accounting based information. The results based on market information show that Fast Moving Consumer Goods (FMCG), healthcare and oil and gas sectors are the most defensive sectors of the Indian economy whereas metal and Information Technology (IT) sectors are the most aggressive sectors of the Indian economy. John M. Maheu, Thomas H. McCurdy (2007), Expected return on the market portfolio is an important input for many decisions in finance such as risk adjusted discount rates, capital budgeting decisions etc. This paper investigates the conditional version of risk and returns specification and evaluates the market risk return relationship for US equity over the period of 1840 – 2006.study concludes that the relationship between the risk and return for the market premium is positive. Higher the risk, the higher the return. Asli Demirgüç-Kunt, Harry Huizinga (2009), This paper examine the implications of a bank's activity mix and funding strategies for its risk and return using sample of 1334 banks in 101 countries during the 2007 financial crisis. Study concludes that universal banking model is the best way to conduct investment banking business in a safe manner. Raphie Hayat and Roman Kraeussl (2009), This article focuses on Islamic equity funds (IEFs) which differs fundamentally from conventional equity funds. Muslims are prohibiting to pay or receive interest and to invest in unethical companies. Study analyse the performance of Islamic equity funds over the last decade by calculating their risk and return Muslims are not the only source of growth for IEFs. Even the non-Muslim market offers growth potential, as IEFs are often perceived as a form of Socially Responsible Investing. Eric Girard, Amit Sinha (2008), This article investigates the risk and return relationship of stocks traded in the frontier markets and focuses on better understanding the risks involved in small illiquid, less accessible and less known stocks which are traded in frontier markets. Article examines the risk premium of 360 stocks traded in 19 frontier markets for the period from 1997 to 2004.Study concludes that investing in small and value stocks are less risky than large and growth stock. political, economic and financial factors have greater impact on the risk premiums. John H. Cochrane(2001), This paper analyzes the risk and return of venture capital investments and measure the expected return, standard deviation, alpha, beta and residual standard deviation of venture capital investment projects. Multiple risk factors are an obvious generalization, though with this approach each additional regressor multiplies the simulation time dramatically. Combining the two modifications, the risks (betas, standard deviation) of the firm. Arthur Korteweg, Morten Sorensen (2009), The author focuses on venture capital investments in entrepreneurial companies. dynamic selection problem arises because valuations of portfolio companies are only observed when the companies receive funds. Author develops a general model of dynamic sample selection and estimates it using data from venture capital investments in entrepreneurial companies and concludes that selection correction leads to markedly lower intercepts and higher estimates of risks compared to previous studies.

Methodology

The Descriptive research is used for the study. It describes the characteristics of risk and return. The results can be used for making investment decision amongst the ten industries chosen for the research. The method adopted for this technique is Purposive sampling technique. Sampling is done with the purpose of evaluating the risk and return variations and constructing a portfolio thereby.

Tools for analysis:

FORMULAS USED:

1. Cut off point = $\frac{\sigma m^2 \ \Sigma(R_i - R_f)\beta/\sigma^2 ei)}{1+\sigma m^2 \Sigma(\beta^2/\sigma_{ei}{}^2)}$

2. Excess Return = $\frac{(R_i - R_f)}{\beta}$

3. Z_i = $(\beta^2/\sigma_{ei}{}^2)[(R_i - R_f)/(\beta - C)]$

4. X_i = $z_i/\Sigma z_i$

Analysis and Interpretation

Table 1.1 Return, Standard Deviation, Beta of BRITANNIA from 2005-2009

Year	Index price	Index return(x)	Stock price	Stock return(y)	Standard deviation (x)	Standard deviation (y)	Beta
2005	2269.52	0.12363	1024.71	0.1643	1.1076	1.5923	0.3688
2006	3359.18	0.14841	1345.11	-0.0729	1.6445	1.9555	0.4764
2007	4573.56	0.18491	1427.30	0.1356	1.6004	1.9027	0.1493
2008	4331.74	-0.25855	1345.02	-0.0261	2.7857	1.9180	0.2493
2009	4113.93	0.24469	1560.98	0.1149	2.1813	1.6656	0.1278

From the above table it can be inferred that the highest return of Britannia is 52% in the year 2005 as against a market return of 30% and the lowest in the year 2008 with a return of -8% as against a market return of -58%. The beta value fluctuated between 0.12 and 0.36 in the years 2009 and 2005 respectively.

Table 1.2 Return, Standard Deviation, Beta of DABUR from 2005-2009

Year	Index price	Index return(x)	Stock price	Stock return(y)	Standard deviation(x)	Standard deviation(y)	Beta
2005	2269.52	0.1236	139.32	0.3602	1.1076	2.3267	0.8183
2006	3359.18	0.1484	138.78	-0.0302	1.6445	4.2568	0.8482
2007	4573.56	0.1849	105.62	-0.0402	1.6004	3.2658	0.3803
2008	4331.74	-0.2585	93.59	-0.0858	2.7914	3.1177	0.5680
2009	4118.42	0.2462	122.61	0.2813	2.1815	1.8789	0.2474

The above table shows that the stock return was the highest in the year 2009 with a value of 74% as against a market return of 28%.The lowest return was in the year 2006 with a value -6.2% as against a market return of 33%.The beta reported the highest in 2006 ie.,0.84 and the lowest 0.2 in the year 2009.

Table 1.3 Return, Standard Deviation, Beta of GLAXO from 2005-2009

Year	Index price	Index return(x)	Stock price	Stock return(y)	Standard deviation(x)	Standard deviation(y)	Beta
2005	2269.52	0.1236	832.32	0.1645	1.1076	1.6314	0.6215
2006	3359.18	0.1484	1212.59	0.0479	1.6445	2.4425	0.9555
2007	4573.56	0.1849	1150.99	-0.0325	1.6004	1.8241	0.4126
2008	4331.74	-0.2585	1077.68	0.0645	2.7914	2.0748	0.2928
2009	4118.42	0.2462	1330.7	-0.1959	2.1815	5.5393	0.1342

From the above table, it is inferred that the highest stock return was in the year 2005 ie.,339% as against a market return of 28% and the lowest return in the year 2007 with a value of -67% and the market return was 41.7%.The beta fluctuated between -0.13 in the year 2009 and 0.95 in the year 2006.

Table 1.4 Return, Standard Deviation, Beta of GODREJ from 2005-2009

Year	Index price	Index return(x)	Stock price	Stock return(y)	Standard deviation(x)	Standard deviation(y)	Beta
2005	2269.52	0.1236	376.95	0.2288	1.1076	1.8624	0.3129
2006	3359.18	0.1484	475.23	-0.2223	1.6445	5.2855	0.3189
2007	4573.56	0.1849	139.98	-0.0162	1.6004	2.1956	0.3640
2008	4331.74	-0.2585	124.33	0.0248	2.7914	2.4136	0.3247
2009	4118.42	0.2462	194.02	0.2890	2.1815	2.5028	0.2275

The table shows that the stock return was highest in 2009 with 55.37% as against a market return of 65.23% and lowest in the year 2007 with and the market return during this year was -3.7%.The beta value of Godrej ranged from 0.22 to about 0.36.

Table 1.5 Return, Standard Deviation, Beta of HUL from 2005-2009

Year	Index price	Index return(x)	Stock price	Stock return(y)	Standard deviation(x)	Standard deviation(y)	Beta
2005	2269.52	0.1236	157.75	0.1420	1.1076	1.8784	0.8199
2006	3359.18	0.1484	237.07	0.0695	1.6445	2.3719	1.0283
2007	4573.56	0.1849	203.27	0.0142	1.6004	1.9663	0.5493
2008	4331.74	-0.2585	232.85	0.0906	2.7914	2.6413	0.5529
2009	4118.42	0.2462	258.57	0.0443	2.1815	1.9867	0.2125

The above table reveals that the highest stock return was during the year 39% whereas the market return was 2005 and the lowest return was 4% was 2007 with a market return of 42%.The beta fluctuated from 0.21 to highest of 1.02 in the years of 2009 and 2006.

Table 1.6 Return, Standard Deviation, Beta of ITC from 2005-2009

Year	Index price	Index return(x)	Stock price	Stock return(y)	Standard deviation(x)	Standard deviation(y)	Beta
2005	2269.52	0.1236	1121.81	-0.1969	1.1076	6.1098	0.8913
2006	3359.18	0.1484	177.86	0.1159	1.6445	2.1942	1.0529
2007	4573.56	0.1849	169.63	0.0887	1.6004	2.0450	0.5332
2008	4331.74	-0.2585	192.03	-0.0609	2.7914	2.6621	0.6069
2009	4118.42	0.2462	212.18	0.1918	2.1815	2.3003	-0.0336

The above table shows that the highest stock return was during the year 2009 ie.,138%as against an index return of 56% and the lowest stock return was -142%during 2005 as against an index return of 28%.The beta value ranges between the lowest in the year 2009 with -0.03 to the highest 0.89 in the year 2005.

Table 1.7 Return, Standard Deviation, Beta of NIRMA from 2005-2009

Year	Index price	Index return(x)	Stock price	Stock return(y)	Standard deviation(x)	Standard deviation(y)	Beta
2005	2269.52	0.1236	408.04	0.1409	1.1076	1.9852	0.6466
2006	3359.18	0.1484	422.16	-0.0816	1.6445	1.8918	0.5165
2007	4573.56	0.1849	208.82	-0.0082	1.6004	4.2740	0.6212
2008	4331.74	-0.2585	145.90	-0.3448	2.7914	2.6785	0.5446
2009	4118.42	0.2462	144.46	0.4121	2.1815	3.8638	0.4564

From the table it can be inferred that the highest individual return of Nirma was 348% during the year 2009 as against the market return of 56%. The lowest return was in 2008 with a vaue of -291% which is directly proportional to the negative market return of -58%.The beta value, almost remained constant over the five year period with the highest of 0.645 in 2005 and lowest in 2009 with 0.45.

Table 1.8 Return, Standard Deviation, Beta of P&G from 2005-2009

Year	Index price	Index return(x)	Stock price	Stock return(y)	Standard deviation(x)	Standard deviation(y)	Beta
2005	2269.52	0.1236	693.02	0.1593	1.1076	1.6670	0.2394
2006	3359.18	0.1484	894.98	0.0246	1.6445	2.0769	0.4446
2007	4573.56	0.1849	776.17	-0.0263	1.6004	1.5038	0.0435
2008	4331.74	-0.2585	741.47	0.0058	2.7914	1.8785	0.2839
2009	4118.42	0.2462	1078.94	0.0155	2.1815	5.8786	0.1857

The table shows that the stock return was at its peak in 2005 with a value of 89% as against the market return of 28%. The lowest stock return was in 2007 with -15% as against 42% market return.The beta value ranged between 0.04 (2007) and 0.28 (2008)

Table 1.9 Return, Standard Deviation, Beta of RUCHI from 2005-2009

Year	Index price	Index return(x)	Stock price	Stock return(y)	Standard deviation(x)	Standard deviation(y)	Beta
2005	2269.52	0.1236	237.36	0.3202	1.1076	3.3218	0.9636
2006	3359.18	0.1484	300.49	0.1437	1.6445	3.1745	0.5006
2007	4573.56	0.1849	325.62	0.0677	1.6004	6.0409	0.2700
2008	4331.74	-0.2585	81.16	-0.6146	2.7914	4.3397	0.2476
2009	4118.42	0.2462	54.50	0.6043	2.1815	4.8033	1.1615

The above table reveals the stock return being highest in the year 2009 as against a market return of 56% and the lowest being a negative return of -118% as against negative market return of -58% in the year 2008.The beta value has been the lowest in the year 2008 with a value of 0.24 and the highest with a value of 1.16 in the year 2009.

Table 1.10 Return, Standard Deviation, Beta of RUSSAL from 2005-2009

Year	Index price	Index return(x)	Stock price	Stock return(y)	Standard deviation(x)	Standard deviation(y)	Beta
2005	2541.31	0.2018	65.465	0.4231	1.1818	4.2466	1.7202
2006	3359.18	0.1484	112.11	0.1596	1.6445	3.8812	1.0915
2007	4573.56	0.1849	65.63	0.0045	1.6004	3.1786	0.8051
2008	4331.74	-0.2585	72.59	-0.1108	2.7914	5.0682	1.0735
2009	4113.93	0.2446	135.76	0.7540	2.1859	3.7699	0.6194

The table shows that the Russal stock has been highest in 2009 with a return of 61% whereas the market return was 55% and the lowest return was in 2008(-9%) as against a market return of -58%.The beta value fluctuated between 0.61 to a highest of 1.72 in the year 2005

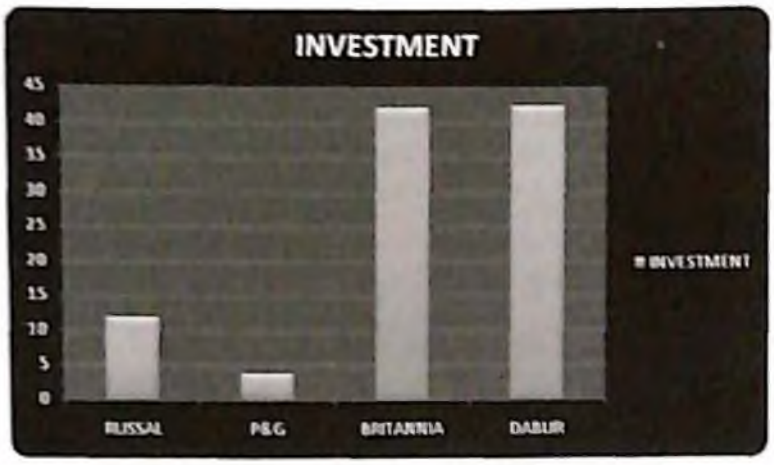
CUT - OFF POINT

Securities	(ri-rf)*β	((ri-rf)*β)/unsys risk	Cumm	B^2/unsys risk	Cumm	Num	Den	Cutoff point
RUSSAL	10.57	0.6381	0.63	0.0001	0.0001	2.43	1.00	2.43
P&G	2.06	0.2197	0.85	0.0003	0.0004	3.27	1.00	3.27
BRITANNIA	8.02	2.4322	3.29	0.0037	0.0041	12.57	1.01	12.37
DABUR	23.90	2.4971	5.78	0.0046	0.0088	22.11	1.03	21.39
GODREJ	9.58	0.9840	6.77	0.0020	0.0109	25.87	1.04	24.83
HUL	22.70	4.7298	11.50	0.0156	0.0265	43.94	1.10	39.89
RUCHI SOYA	69.64	3.4660	14.96	0.0162	0.0428	57.19	1.16	49.14
ITC	5.53	0.4667	15.43	0.0036	0.0465	58.97	1.17	50.07
GLAXO SMITH	0.49	0.0530	15.48	0.0005	0.0470	59.17	1.17	50.15
NIRMA	-1.68	-0.1752	15.31	0.0006	0.0477	58.50	1.18	49.48

INVESTMENT

SECURITIES	CUTOFF POINT	Z	X
RUSSAL	2.43	0.631978	11.82383
P&G	3.27	0.204068	3.81795
BRITANNIA	12.37	2.246107	42.02295
DABUR	21.39	2.2628	42.33527

PROPORTION OF INVESTMENT



From the above table it can be clearly interpreted that an equal proportion of 42% in both can be invested in both BRITANNIA and DABUR. RUSSAL, despite being a small cap paves way for around 12% of investment and the least of around 4% is preferred for PROCTER AND GAMBLE.

Findings

- The BRITANNIA stock returns have been negative in 2006&2008(-0.07 &0.02), though the market returns have been negative only in 2008. But the values of beta have been remaining constant with an average of 0.25.
- DABUR too has shown a declining trend in its return from -0.03 to -0.08 in 2006-08.This is not reflected in the beta as the market returns have been high.
- In GLAXO, though the values of beta have been positive in the first four years, the last year showed a negative value of -0.1 and this was due to the declining stock return, in spite of market return being 0.24.
- The GODREJ returns have been negative in 2006&'07 despite the market returns of .14 and .18.This was stabilized in the subsequent year, when it showed a return of -.24, in spite of the market's decline.
- The beta values of HUL and ITC have been highly fluctuating from 0.2 to 1.02 and -0.3 to 1.05 because of high variations in the market and individual stock returns in all the five years.
- NIRMA stock returns are negative from 2006-08with values around -0.05, but because of the high market returns, the beta values have remained constant around 0.5.
- P&G and RUCHI Soya have shown an increasing trend in the stocks except in 2008. Separately for beta of P&G which is in the range of 0.04 to 0.44
- The stock returns of RUSSAL has been directly proportional to the market returns and the beta values have shown a majority of beta values above 1 indicating high fluctuations.
- The major portion of investment can be made on DABUR & BRITANNIA, from which good rate of return can be expected. And minor investment can be made on RUSSAL and P&G.

Suggestions

- The FMCG sector has performed in spite of the hit of recession and hence it is fruitful for investors to expect good returns when compared to the other sectors.
- For risk loving investors, HUL and ITC prove a great scope as the returns are the maximum when the risk is very high.
- Dabur and Glaxo show very high fluctuations in beta and hence might not generate constant returns
- For regular, but minimum returns with a minimized risk, Godrej and Nirma show good signs with very stabilized returns.
- Ruchi and McLeod Russel stocks are very much favourable for investors willing to take maximum risk.
- P&G and Britannia have also been generating constant returns with minimum risk and hence paves way for mediocre investors.

Conclusion

The study on 'Portfolio construction of the FMCG sector' is limited to only ten firm in the industries listed in NSE. The tools used in the study reflect the pavement for comparing the essential elements in terms of risk and return and paves scope for future study. There have been sharp differences in the performance of the industry in the last five years. Though the recession has brought out significant decline in the trends, the rate of growth is remarkable. The Industry attracts all kinds of investors, whether risky, non-risky or with mediocre risk preferences. Thus, investment in the FMCG sector can be very beneficial to investors in the long run.

References:-

- Arthur Korteweg, Morten Sorensen (2009)," Risk and Return Characteristics of Venture Capital-Backed Entrepreneurial Companies".
- Asli Demirgüç-Kunt, Harry Huizinga (2009)," Bank Activity and Funding Strategies: The Impact on Risk and Return".
- Bharati V. Pathak, "Indian Financial and Risk Management Systems. Pp.135-152

Ball,Ray . (2000)."The Theory of Stock Market Efficiency : Accomplishments and Limitations". Journal of Applied Corporate Finance 8 no .1 (Spring) Pp.4-18.

- Capital As Risk Absorber United States Banker. New York:May 1989. Vol. 98, Iss. 5, p. 61 (3 pp.)
- Chan,Wesley. (2003). "Stock Price Reaction to News & No News". Journal of Financial Economics 70, no 2 (November);Pp. 223-260.
- Coyne, Thomas Joseph (1982), " Electric Utility Profitability in Ohio
- Danz R.W. (2002). "The Relationship between Return and Market Value of stocks". Journal of Financial Economics 9 no .1 (March) ;Pp.3-18.
- Donald E.Fischer & Ronald J. Jordan."Security Analysis and Portfolio Management".Sixth Edition , Pp 637-651
- Eichholtz. (2003). "Does International Diversification Work Better for stocks "? Financial Analysts Journal 52,no 1, Pp.56-62.
- Electric Utility Profitability in Ohio (When Risk Is Compared with Reward) Coyne, Thomas Joseph. Public Utilities Fortnightly. Washington : Sep 16, 1982. Vol. 110, Iss. 6, Pp.45-50
- Eric Girard, Amit Sinha (2008), " Risk and Return in the Next Frontier" Journal of Emerging Market Finance, Vol. 7, pp. 43-80, January 2008
- Hyman, Leonard s., Egan Joseph M(1980), "The Utility Stock Market: Regulation, Risk, and Beta
- Leonard S., Egan, Joseph M The Utility Stock Market: Regulation, Risk, and BetaHyman,.. Public Utilities Fortnightly. Washington:Feb 14, 1980. Vol. 105, Iss. 4, p. 21
- M.Y Khan, P. K. Jain Basic Financial Management (Second Edition) Risk Management(Pg 2.20-2.27)
- Robert Ferguson and dean Leistikow , 'Futures hedge profit measurement, error-correction model vs. regression approach hedge ratios, and data error effects' Pp. 27-46
- Sangeetha D,Mishra and Dheeraj Misra, ' Analysis of risk and returns; a study of Indian industrial sectors
- Taxman , "Securities Markets and Products "Chapter-4, Pp.95-112