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Portfolio management by an investor and suggesting the optimal portfolio using sharpe model

Divyesh J Gandhi

Abstract

Since the composition of portfolio is a factor considered by the managers, shareholders and other interested individuals and institutions. Therefore, it is essential for them to recognize and inform of the components of portfolio. How to shape the portfolio of the company, its impact on performance and effective at the company, and its relevance with systematic risk of companies is noteworthy for shareholder, financial managers, creditors, as well as competitors of the companies.

Keywords: Sharpe Model, Portfolio management

Introduction

We all dream of beating the market and being super investors and spend an inordinate amount of time and resources in this endeavor. Consequently, we are easy prey for the magic bullets and the secret formulae offered by eager salespeople pushing their wares. In spite of our best efforts, most of us fail in our attempts to be more than average investors. Nonetheless, we keep trying, hoping that it can be more like the investing legends – another Warren Buffett or Peter Lynch. We read the words written by and about successful investors, hoping to find in them the key to their stock-picking abilities, so that It Canreplicate them and become wealthy quickly.

In our search, though, we are whipsawed by contradictions and anomalies. In one corner of the investment town square, stands one advisor, yelling to us to buy businesses with solid cash flows and liquid assets because that's what worked for Buffett. In another corner, another investment expert cautions us that this approach worked only in the old world, and that in the new world of technology, we have to bet on companies with solid growth prospects. In yet another corner, stands a silver tongued salesperson with vivid charts and presents you with evidence of his capacity to get you in and out of markets at exactly the right times. It is not surprising that facing this cacophony of claims and counterclaims that we end up more confused than ever.

In this introduction, we present the argument that to be successful with any investment strategy, you have to begin with an investment philosophy that is consistent at its core and which matches not only the markets you choose to invest in but your individual characteristics. In other words, the key to success in investing may lie not in knowing what makes Peter Lynch successful but in finding out more about yourself.

In 1952, Arthur D. Roy suggested maximizing the ratio $(m-d)/\sigma$, where m is expected gross return, d is some "disaster level" (a.k.a., minimum acceptable return) and σ is standard deviation of returns. This ratio is just the Sharpe ratio, only using minimum acceptable return instead of the risk-free rate in the numerator, and using standard deviation of returns instead of standard deviation of excess returns in the denominator.

In 1966, William Forsyth Sharpe developed what is now known as the Sharpe ratio. Sharpe originally called it the "reward-to-variability" ratio before it began being called the Sharpe ratio by later academics and financial operators. The definition was:

Sharpe's 1994 revision acknowledged that the basis of comparison should be an applicable benchmark, which changes with time. After this revision, the definition is:

Recently, the (original) Sharpe ratio has often been challenged with regard to its appropriateness as a fund performance measure during evaluation periods of declining markets.

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Stock market is a market where stocks are bought and sold. In an economy, besides playing the role of a source for financing investment, stock market also performs a function as a signaling mechanism to managers regarding investment decisions, and a catalyst for corporate governance. However, stock market is best known for being the most effective channel for company's capital raise. People are interested in stock because of "long-term growth of capital, dividends, and a hedge against the inflationary erosion of purchasing power". The other feature that makes the stock market more attractive than other types of investment is its liquidity. Most people invest in stocks because they want to be the owners of the firm, from which they benefit when the company pays dividends or when stock prices increases. However, many people buy stocks for the purpose of control over the firms. Regularly, shareholders need to own specific amount of shares to be in the board of directors who can make strategic decisions and set directions for the firms. Vietnamese stock market has come into operation more than 10 years. It was just develop slowly from the speculative bubble in 2006–2007. The VN-index had an amazing fluctuation from 2006 to 2009. It was about 300 points and reached highest historical peak (over 1100) points of VN-index in March 2007, then after the stock bubble burst in 2008 VN-index fell around 250–300 points at beginning of 2009 and VN-index is still around 350 points in 2011 (Vuong, 2011). The stock prices declined dramatically which was consequence of moving capital from stock market to the real estate market and caused withdrawal of numerous investors as the manifestation of effect of behavioral factors on investors' decisions and reactions. To have an indepth insight into the investors' decisions, there is a necessity to investigate which behavioral factors influencing the decisions of individual investors at the Securities Companies in Ho Chi Minh City. It will be useful for investors to understand common behaviors, from which justify their reactions for better returns. Securities Companies may also use the finding of this research for better understanding on investors' decision to give better recommendations to them. Thus, stock prices will reflect their true value and Ho Chi Minh stock market becomes the yardstick of the economy's wealth and helps enterprises to raise capital for business activities.

Literature Review

Dr. Arifur Rehman Shaikh, Dr. Anil B. Kalkundarikar (2011) the research makes a pertinent revelation that the level of investment knowledge significantly leverages the returns on the investments. From the calculated correlation analysis data it can be observed that 0.096 point change in knowledge boosts investors return expectation by 1 point. Investors having extensive investment knowledge has the return expectation of multifold when compared to other knowledge categories and the correlation analysis between the occupation of investor and the level of risk assume shows that there is a negative correlation between these two variables, analysis shows that a 1 point change in occupation will lead to negative change of 0.053 in the level of risk taken by the investors ^[6]. B.n.dutta smriti mahavidyalaya, b. (2013). This study do analysis so far it is clear that the construction of optimal portfolio investment by using Sharpe's Single Index Model is easier and more comfortable than by using Markowitz's Mean-Variance Model. In his seminal contribution Sharpe argued that there is a considerable similarity between efficient portfolios generated by SIM and Markowitz's Model. This model can show how

risky a security is, if the security is held in a well-diversified portfolio ^[7]. bialowolski, p. (2014) the questionnaire used to gather data was developed relying largely on the available empirical research on investment decision process. Although this research has developed in the recent years, and has applied increasingly sophisticated data and methods, it is still far from perfect. Above all, the results presented are so strongly linked to the organizational form, size and branch a company operates in that they often prevented us from obtaining more general and universal conclusions ^[8]. brownb, w. h. (2006). Should investors hire active portfolio managers or should they adopt a more passive approach to investing? The answer to that question depends on many factors, not the least of which is how the central issue is framed. Consistent with the previous literature, in this study we have shown that over the period from 1979 to 2003 the typical mutual fund produced returns that failed to meet expectations ^[10]. dar, m. a. (n.d.). "Individuals who cannot master their emotions are ill-suited to profit from the investment process." Benjamin Graham. Father of Value Investing "You make most of your money in a bear market; you just don't realize it at the time." Shelby Cullom Davis. So for above study reveals that most investors are emotional and maximize money flows at the wrong times - a sure-fire way to reduce potential returns. Strategies that eliminate the emotional response to investing should produce returns that are significantly greater than those indicated by the typical investor responding to the market rather than proactively investing in the market. Diplomat, during extreme periods for the market, investors often make decisions that can undermine their ability to build long-term wealth. It is important to understand that periods of market uncertainty that can create wealth-building opportunities for the patient, diligent, longterm investor ^[11]. dileepudupi, d. s. (2013, oct-dec) So we may conclude that William Sharpe's Single Index Model will be sustainable and applicable to the Indian market where investors can construct a portfolio for improving the expected returns on their investment. However, in this study we not considered Industry analysis and Economic analysis. It is suggested to the Indian investors that, they can apply Sharpe's Single Index Model to get a better returns in the secondary market for constructing a portfolio with more sectors for better diversification ^[12]. dr.kuberudu burlakanti, r. c. (2013, may) For small investors who can afford only small amounts of investments in stock markets, undoubtedly Mutual funds are best option but one has to bet in better yielded and outperformed funds rather than investing in low yielded funds and NFOs. Necessary evaluation has to be carried out to choose right fund to yield optimum returns. Indicators in present study may not be appropriate in all cases but are reliable in predicting future expected returns based on past performance of these funds in scientific manner. Mutual fund investors are also advised to stay on investing in funds for long term horizon (more than 5 years) and short term investment may lead to high volatility of returns (High risk) and even negative returns ^[14].

Research Methodology

Objective

1. To construct an optimal portfolio empirically using the Sharpe's Single Index Model.
2. To determine return and risk of the optimal portfolio constructed by using Sharpe's Single Index Model.
3. To study the behavior of retail investor regarding portfolio management

Research Design

Descriptive Research design has been used for this research.

Sources of Data Collection**Primary Sources**

The data collected through inquiry such data are originally generated through survey and discussion with retail investors who invest in stock market. Primary data are in form of raw material on which proper method are applied to get perfect output. The data was collected through questionnaire.

Secondary Sources

The data collected through books and search on internet, journals etc. It is the information collected from records, company websites and also discussed with management of the organization.

Sampling Plan

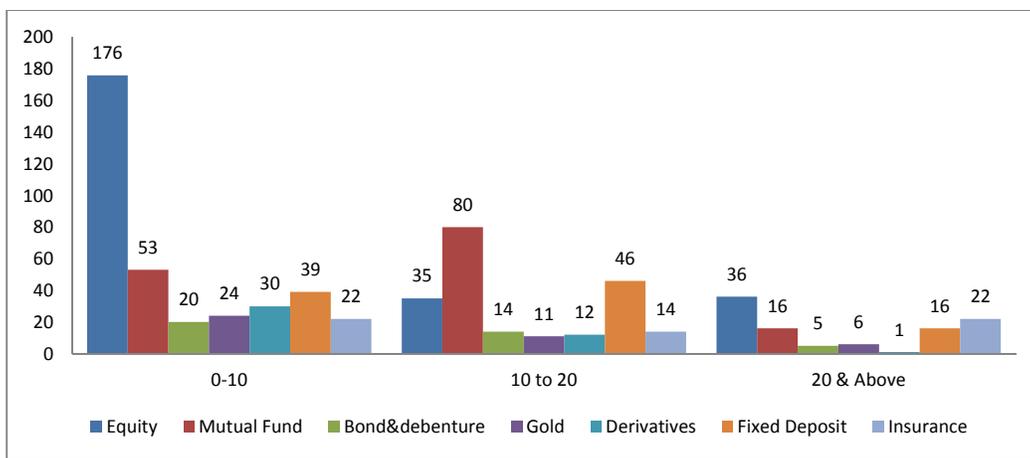
| | | |
|---|-----------------|------------------------------------|
| 1 | Sample Size | 300 Samples |
| 2 | Sample Units | Retail Investors |
| 3 | Sampling Method | Non probability convenience Method |
| 4 | Sampling Area | Navsari City |

Results and Discussion**Table 1: Demographic Variables**

| Factor | Categories | Count | Percentage | |
|--|---|-----------------------------|------------|------------|
| Gender | Male | 250 | 83 | |
| | Female | 50 | 17 | |
| Age | 18-25 | 40 | 13 | |
| | 26-35 | 73 | 24 | |
| | 36-45 | 100 | 34 | |
| | 46-55 | 43 | 14 | |
| | More than 55 | 44 | 15 | |
| Educational Level | Undergraduate | 82 | 27 | |
| | Graduate | 167 | 56 | |
| | Postgraduate | 51 | 17 | |
| Occupation | Professional | 27 | 9 | |
| | Service | 187 | 63 | |
| | Own business | 70 | 23 | |
| | Housewife | 12 | 4 | |
| | Student | 4 | 1 | |
| Annual Income | Less than 150000 | 35 | 12 | |
| | 150000-300000 | 75 | 25 | |
| | 300000-450000 | 143 | 47 | |
| | More Than 450000 | 47 | 16 | |
| Factor Affecting on Portfolio Management By The Investors | | | | |
| No. | Factor | Categories | Count | Percentage |
| 1 | Do You Invest In Stock Market? | Yes | 300 | 100 |
| | | No | 0 | 0 |
| 2 | How Much Do You Invest Annually? | Less Than 50000 | 113 | 38 |
| | | 50000-100000 | 133 | 44 |
| | | 100000-150000 | 40 | 13 |
| | | More Than 150000 | 14 | 5 |
| 3 | In Which Broking Firm You Invest? | K.R.Choksey | 133 | 45 |
| | | Marwadi Broking Firm | 13 | 4 |
| | | Dani Broking Firm | 28 | 9 |
| | | Angel Broking Firm | 33 | 11 |
| | | Sherkhan Broking Firm | 14 | 5 |
| | | India Infoline Broking Firm | 34 | 11 |
| | | Other | 45 | 15 |
| 4 | How Long Have You Been An Investor Of Your Broking Firm? | Less Than 1 Year | 27 | 12 |
| | | 1 To 2 Year | 98 | 25 |
| | | 3 To 5 Year | 83 | 47 |
| | | More Than 5 Year | 92 | 16 |
| 5 | What Is Your Frequency Of Using Services From Your Broking Firm? | Daily | 87 | 29 |
| | | Weekly | 41 | 14 |
| | | Monthly | 54 | 18 |
| | | Other | 118 | 39 |
| 6 | Upto What Extent(Level) Do You Have Knowledge Regarding Portfolio Management? | Little | 80 | 27 |
| | | Some | 88 | 29 |
| | | Moderate | 60 | 20 |
| | | Good | 58 | 19 |
| | | Extensive | 14 | 5 |
| 7 | What Are Your Objectives Regarding Portfolio Management? | Earn Regular Income | 76 | 25 |
| | | Wealth For Retirement | 23 | 8 |
| | | Achieve Investment Goal | 50 | 17 |
| | | Multiple Objective | 86 | 29 |

| | | | | |
|----|--|-------------------|-----|----|
| | | Safety Of Capital | 47 | 15 |
| | | Others | 11 | 4 |
| | | Earn Capital Gain | 7 | 2 |
| 8 | What Is The Level Of Risk Assumed By You Regarding Portfolio Management? | Low | 51 | 17 |
| | | Moderate | 132 | 44 |
| | | High | 111 | 37 |
| | | Very High | 6 | 2 |
| 9 | How Much Return on Investment Rate Is Expected Regarding Portfolio Management? | <8 | 20 | 7 |
| | | 8 to 12 | 94 | 31 |
| | | 12 to 16 | 117 | 39 |
| | | >16 | 69 | 23 |
| 10 | Do You Use Any Technique For Evaluation? | Yes | 73 | 24 |
| | | no | 227 | 76 |
| 11 | If Yes Then Which Technique Analysis Do You Prefer While Investing? | Fundamental | 30 | 41 |
| | | Technical | 43 | 59 |
| 12 | Do You Know Regarding Sharpe Index Model? | Yes | 51 | 17 |
| | | No | 249 | 83 |
| 13 | Have You Ever Used Sharpe Index Model? | Yes | 19 | 6 |
| | | No | 281 | 94 |

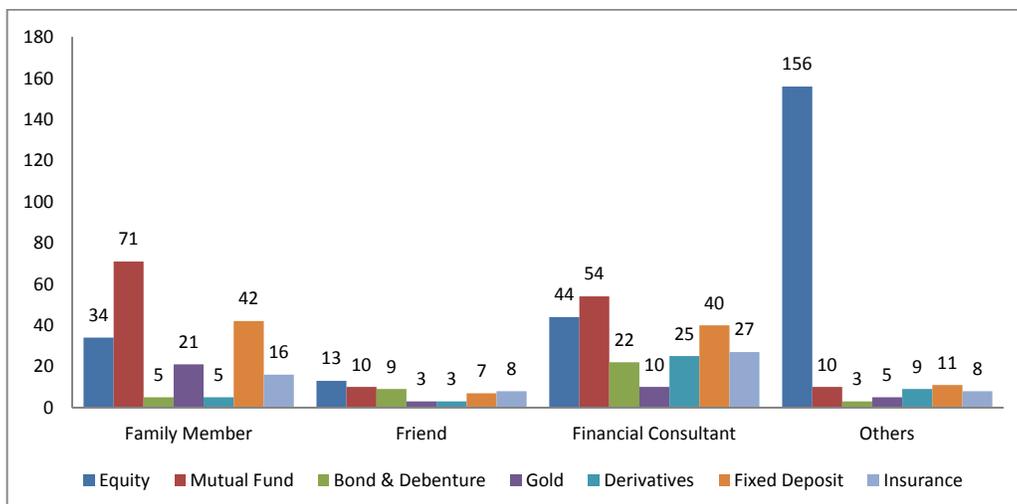
Que.14 What Percentage of Income Is Invested In Following Services?



From the above chart it can say that 176 investors are invest in equity 0 to 10 percentage which was highest and 20 investors is invest in bond & debenture 0 to 10 percentage which was lowest, 80 investors are invest in mutual fund 10 to 20 percentage which was highest and 11 investors is invest in gold 10 to 20 percentage which was lowest, 36 investors

are invest in equity 20 & above percentage which was highest and 1 investors is invest in derivatives 20 & above percentage which was lowest.

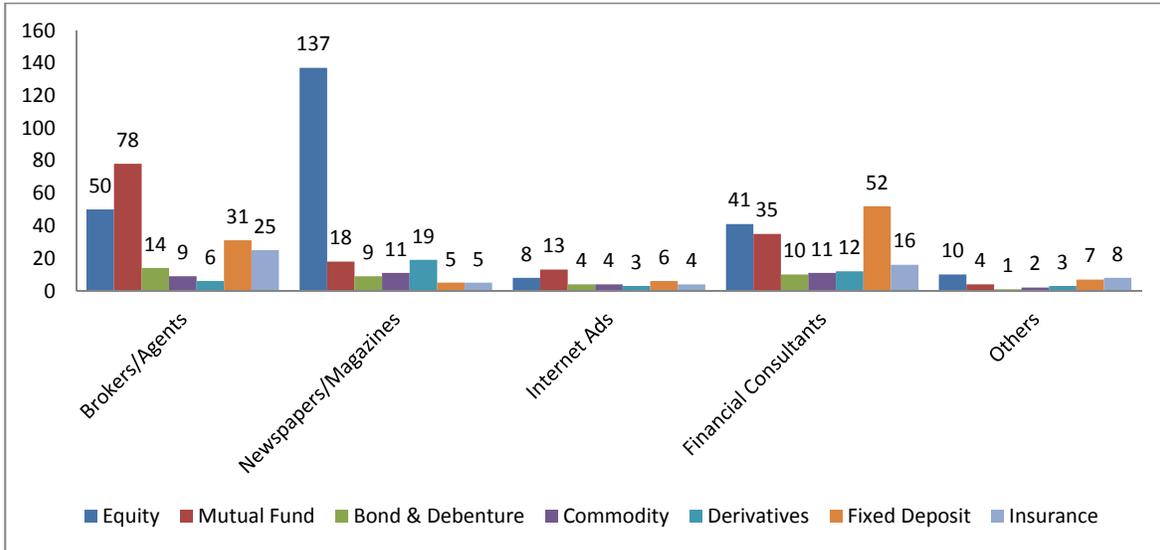
Que.15 What Are the Factors Affecting the Investment Behavior?



From the above chart it can say that 71 investors are investing in mutual fund factor affecting investors behavior family member which was highest and 5 investors are investing in bond & debenture & derivatives factor affecting investors behavior family member which was lowest, 13 investors are investing in equity factor affecting investors behavior friend which was highest and 3 investors are investing in gold & derivatives factor affecting investors behavior friend which was lowest, 44 investors are investing in equity factor affecting investors behavior financial

consultants which was highest and 10 investors are investing in gold factor affecting investors behavior financial consultants which was lowest, 156 investors are investing in equity factor affecting investors behavior others which was highest and 3 investors are investing in bond & debenture factor affecting investors behavior others which was lowest.

Que. 16 What Are the Sources of Information That Are Used By You?

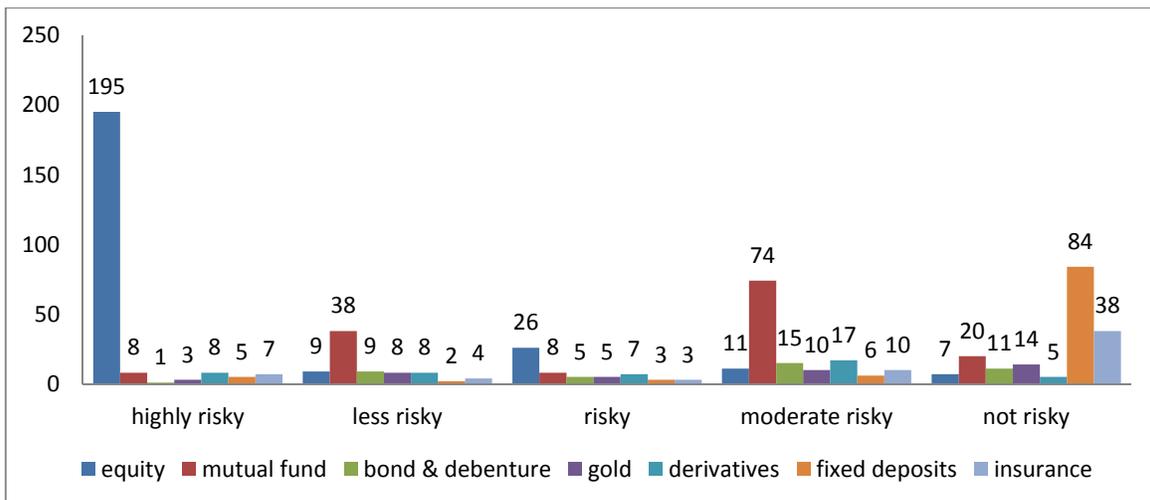


From the above chart it can say that 78 investors are invest using broker advice for mutual fund which was highest and 6 investors are invest using broker advice for derivatives which was lowest, 137 investors are invest using newspapers advice for equity which was highest and 5 investors are invest using newspaper advice for fixed deposits and insurance which was lowest, 13 investors are invest using internet advice for mutual fund which was highest and 4 investors are invest using internet advice for insurance which was lowest, 52 investors are invest using financial consultants advice for

fixed deposit which was highest and 10 investors are invest using financial consultants advice for bond & debenture which was lowest, 10 investors are invest using other advice for equity which was highest and 1 investors are invest using other advice for bond & debenture which was lowest.

Que. 17 As Per the Risk Involved In the Following Services Rank Them Likert Scale

(1-Highly Risky, 2-Less Risky, 3-Risky, 4-Moderate Risky, 5-Not Risky)



From the above chart it can say that 195 investors are saying equity highly risky which was highest and 1 investor is saying bond & debenture highly risky which was lowest.

Que. 18 Friedman Test

H0: There is no statistically significant preference of investors towards various investment avenues.

H1: There is a statistically significant preference of investors towards various investment avenues.

| Particular | Mean rank |
|------------------|-----------|
| Equity | 4.89 |
| Mutual fund | 4.75 |
| Fixed deposit | 4.52 |
| Insurance | 4.03 |
| Bond & Debenture | 3.47 |
| Gold | 3.36 |
| Derivative | 2.99 |

From the above table it can say that investor give first preference to the equity with highest mean rank of 4.89, they give second preference to the mutual fund with mean rank of 4.75, they give third preference to the fixed deposit with mean rank of 4.52, they give fourth preference to the insurance with mean rank of 4.03, they give fifth preference to the bond & debenture with mean rank of 3.47 and they give sixth preference to the gold with mean rank of 3.36 and they give last preference to the derivative with mean rank of 2.99.

| Test Statistics ^a | |
|------------------------------|---------|
| N | 300 |
| Chi-Square | 182.274 |
| Df | 6 |
| Asymp. Sig. | .000 |

Que.19 Crosstabs

| gender * evaluation technique Cross tabulation | | | | | | |
|--|--------|----------------------|----|-----|----|-------|
| Count | | | | | | |
| | | Evaluation technique | | | | Total |
| | | Yes | % | no | % | |
| gender | male | 60 | 24 | 190 | 76 | 250 |
| | female | 13 | 26 | 37 | 74 | 50 |
| Total | | 73 | | 227 | | 300 |

From the above table it can say that 24% male respondents are using evaluation techniques such as fundamental analysis and technical analysis & 76% are not using evaluation techniques for portfolio management and 26% female respondents are using evaluation techniques & 74% are not using evaluation techniques for portfolio management.

Que.20 Frequencies

Objective

| Particular | Percentage |
|-------------------------|------------|
| earn regular income | 27.7 |
| wealth for retirement | 8.4 |
| achieve investment goal | 12.8 |
| earn capital gain | 2.4 |
| safety of capital | 17.0 |
| Multiple objective | 27.4 |
| Other | 4.2 |
| Total | 100.0 |

From the above table it can say that 27.7% investors objective is to earn regular income, 8.4% investors objective is to create wealth for retirement, 12.8% investors objective is to achieve investment goal, 17% investors objective is to safety of capital, 2.4% investors objective is to earn capital gain, 27.4% investors objective is multiple and 4.2% investors objective is for other purpose.

Que. 21 One way ANNOVA

H0: There is no significant variance between demographic profile of the investor with their level of risk & expected return regarding portfolio management.

H1: There is a significant variance between demographic profile of the investor with their level of risk & expected return regarding portfolio management.

| Particular | Risk | Return |
|---------------|-------|--------|
| Gender | 1.000 | 0.000 |
| Age | 0.152 | 0.081 |
| Education | 0.549 | 0.739 |
| Occupation | 0.682 | 0.517 |
| Annual Income | 0.002 | 0.339 |

Que.22 Correlation

H0: There is no significant correlation variance between demographic profile of the investor with their level of risk & expected return regarding portfolio management.

H1: There is a significant correlation variance between demographic profile of the investor with their level of risk & expected return regarding portfolio management.

| Particular | Risk(significant) | Return(significant) |
|---------------|-------------------|---------------------|
| Gender | 1.000 | 0.000 |
| Age | 0.243 | 0.885 |
| Education | 0.397 | 0.611 |
| Occupation | 0.659 | 0.500 |
| Annual Income | 0.029 | 0.109 |

Sharpe Index

This are 10 script we are taking from the CNX NIFTY which are top 10 Companies.

| Number | Security | Return(%) | Beta | R^2 | volatility |
|--------|-------------|-----------|------|------|------------|
| 1 | Infosys | 7.2356 | 0.39 | 0.04 | 1.24 |
| 2 | HDFC | 5.7545 | 1.25 | 0.35 | 1.59 |
| 3 | ITC | -1.5395 | 0.46 | 0.06 | 2.28 |
| 4 | HDFC Bank | 0.2527 | 0.99 | 0.41 | 1.13 |
| 5 | ICICI Bank | -3.9273 | 1.61 | 0.57 | 2.07 |
| 6 | LT | 4.2512 | 1.50 | 0.46 | 2.26 |
| 7 | Reliance | -5.5565 | 1.29 | 0.47 | 1.56 |
| 8 | TCS | 7.7861 | 0.42 | 0.05 | 1.50 |
| 9 | Tata Motors | 0.9442 | 1.45 | 0.40 | 2.13 |
| 10 | Axis Bank | 4.5392 | 1.43 | 0.41 | 2.89 |

Return=Closing Price*100/Opening Price

Risk Free Return=7.72 percent in February of 2015

Market Variance Index = (13.26)^2= 175.8276

Solution

1.Rank the securities calculating Ri-Rf/Bi

| Security | Ri(%) | Rf | Bi | Ri-Rf/Bi |
|-------------|---------|------|------|----------|
| Infosys | 7.2356 | 7.72 | 0.39 | -1.2421 |
| HDFC | 5.7545 | 7.72 | 1.25 | -1.5724 |
| ITC | -1.5395 | 7.72 | 0.46 | -20.1293 |
| HDFC Bank | 0.2527 | 7.72 | 0.99 | -7.5427 |
| ICICI Bank | -3.9273 | 7.72 | 1.61 | -7.2343 |
| LT | 4.2512 | 7.72 | 1.50 | -2.3125 |
| Reliance | -5.5565 | 7.72 | 1.29 | -10.2919 |
| TCS | 7.7861 | 7.72 | 0.42 | 0.1574 |
| Tata Motors | 0.9442 | 7.72 | 1.45 | -4.6730 |
| Axis Bank | 4.5392 | 7.72 | 1.43 | -2.2243 |

2. Arranging the security as per the rank

| Rank | Security | Ri-Rf/Bi |
|------|-------------|----------|
| 1 | TCS | 0.1574 |
| 2 | Infosys | -1.2421 |
| 3 | HDFC | -1.5724 |
| 4 | Axis Bank | -2.2243 |
| 5 | LT | -2.3125 |
| 6 | Tata Motors | -4.6730 |
| 7 | ICICI Bank | -7.2343 |
| 8 | HDFC Bank | -7.5427 |
| 9 | Reliance | -10.2919 |
| 10 | ITC | -20.1293 |

3. Calculation of C*

$$C_i = \frac{\sigma_m^2 \sum_{i=1}^N \frac{(R_i - R_f) \beta_i}{\sigma_{ei}^2}}{1 + \sigma_m^2 \sum_{i=1}^N \frac{\beta_i^2}{\sigma_{ei}^2}}$$

Market Variance Index = (13.26)^2 = 175.8276

| Rank | Security | σ ² | R ² | SR= σ ² *R ² | UR= σ ² - SR |
|------|------------|----------------|----------------|------------------------------------|-------------------------|
| 1 | TCS | 1.50 | 0.05 | 0.0750 | 1.4250 |
| 2 | Infosys | 1.24 | 0.04 | 0.0496 | 1.1904 |
| 3 | HDFC | 1.59 | 0.35 | 0.5565 | 1.0335 |
| 4 | Axis Bank | 2.89 | 0.41 | 1.1849 | 1.7051 |
| 5 | LT | 2.26 | 0.46 | 1.0396 | 1.2204 |
| 6 | TataMotors | 2.13 | 0.40 | 0.8520 | 1.2780 |
| 7 | ICICI Bank | 2.07 | 0.57 | 1.1799 | 0.8901 |
| 8 | HDFCBank | 1.13 | 0.41 | 0.4633 | 0.6667 |
| 9 | Reliance | 1.56 | 0.47 | 0.7332 | 0.8268 |
| 10 | ITC | 2.28 | 0.06 | 0.1368 | 2.1432 |

| Security | Ri-Rf | Bi | σ ² | Ri-Rf*Bi/ σ ² | Bi ² | Bi ² / σ ² | ΣBi ² / σ ² | Bi/ σ ² |
|-------------|----------|------|----------------|--------------------------|-----------------|----------------------------------|-----------------------------------|--------------------|
| TCS | 0.0667 | 0.42 | 1.50 | 0.018676 | 0.1764 | 0.1176 | 0.1176 | 0.28 |
| Infosys | -0.4844 | 0.39 | 1.24 | -0.15235 | 0.1521 | 0.12266 | 0.94783 | 0.314516 |
| HDFC | -1.9655 | 1.25 | 1.59 | -1.54520 | 1.5625 | 0.9827 | 1.93053 | 0.78616 |
| Axis Bank | -3.1808 | 1.43 | 2.89 | -1.57389 | 2.0449 | 0.70757 | 0.825417 | 0.49480 |
| LT | -3.4688 | 1.50 | 2.26 | -1.30453 | 2.25 | 0.99557 | 2.9261 | 0.66371 |
| Tata Motors | -6.7758 | 1.45 | 2.13 | -4.61263 | 2.1025 | 0.98708 | 3.91318 | 0.68075 |
| ICICI Bank | -11.6473 | 1.61 | 2.07 | -9.05901 | 2.5921 | 1.25222 | 5.1654 | 0.77777 |
| HDFC Bank | -7.4673 | 0.99 | 1.13 | -6.54214 | 0.9801 | 0.86734 | 6.03274 | 0.87610 |
| Reliance | -13.2765 | 1.29 | 1.56 | -10.97864 | 1.6641 | 1.06673 | 7.09947 | 0.82692 |
| ITC | -9.2595 | 0.46 | 2.28 | -1.86814 | 0.2116 | 0.09280 | 7.19227 | 0.20175 |

4. Select or Reject the securities Ri-Rf/Bi > Ci

| Security | Ri-Rf/Bi | Ci | Selected/Rejected |
|-------------|----------|-----------|-------------------|
| TCS | 0.1574 | 0.1514876 | Selected |
| Infosys | -1.2421 | -0.30164 | Selected |
| HDFC | -1.5724 | -1.5633 | Selected |
| Axis Bank | -2.2243 | -2.20662 | Selected |
| LT | -2.3125 | -1.3029 | Selected |
| Tata Motors | -4.6730 | -4.6462 | Selected |
| ICICI Bank | -7.2343 | -7.1053 | Selected |
| HDFC Bank | -7.5427 | -7.4936 | Selected |
| Reliance | -10.2919 | -10.2373 | Selected |
| ITC | -20.1293 | -18.9683 | Selected |

6. Percentage to be invested = ΣZi/Zi * 100

| Security | Zi | Zi/ΣZi*100(%) |
|-------------|---------------|---------------|
| TCS | -0.1330 | 0.331420398 |
| Infosys | -0.3038 | 0.757033962 |
| HDFC | -1.6967 | 4.227977364 |
| Axis Bank | -1.7253 | 4.299245209 |
| LT | -2.4537 | 6.114332562 |
| Tata Motors | -4.7641 | 11.87157833 |
| ICICI Bank | -9.2104 | 22.95123635 |
| HDFC Bank | -6.6936 | 16.67966599 |
| Reliance | -11.1302 | 27.73515274 |
| ITC | -2.0195 | 5.032357097 |
| | ΣZ = -40.1303 | |

5. Proportion to be invested Zi = (βi / σ²_{ei}) x [(Ri - Rf / βi) - C]

| Security | Bi ² / σ ² | Ri-Rf/Bi | C* | Zi |
|-------------|----------------------------------|----------|-----------|----------|
| TCS | 0.1176 | 0.1574 | 0.1514876 | -0.1330 |
| Infosys | 0.12266 | -1.2421 | 0.1514876 | -0.3038 |
| HDFC | 0.9827 | -1.5724 | 0.1514876 | -1.6967 |
| Axis Bank | 0.70757 | -2.2243 | 0.1514876 | -1.7253 |
| LT | 0.99557 | -2.3125 | 0.1514876 | -2.4537 |
| Tata Motors | 0.98708 | -4.6730 | 0.1514876 | -4.7641 |
| ICICI Bank | 1.25222 | -7.2343 | 0.1514876 | -9.2104 |
| HDFC Bank | 0.86734 | -7.5427 | 0.1514876 | -6.6936 |
| Reliance | 1.06673 | -10.2919 | 0.1514876 | -11.1302 |
| ITC | 0.09280 | -20.1293 | 0.1514876 | -2.0195 |

Findings

1. Among the respondent 83% investors are male & 17% respondents are female.
2. Among the respondent 34% investors are belong to 36-45 age group.
3. Among the respondent 56% investors are graduate, 27% investors are undergraduate & 17% investors are postgraduate.
4. Among the respondent 63% investors occupation is service.

5. Among the respondent 47% investors annual income is 300000-450000.
6. Among the respondent 44% investors are annually invest in stock market between 50000-100000.
7. Among the respondent
8. Among the respondent 45% investors are invest in K.R. Choksy.
9. Among the respondent 47% investors are using the broking firm service between 3 to 5 year.
10. Among the respondent 39% investors are using broking firm service frequency is monthly.
11. Among the respondent
12. Among the respondent 29% investors have knowledge regarding portfolio management at some level.
13. Among the respondent 29% investors objective is to multiple purpose for portfolio management.
14. Among the respondent 44% investors are assumed moderate risk regarding portfolio management.
15. Among the respondent 39% investors are expect return between 12-16% regarding portfolio management.
16. Among the respondent
17. Among the respondent
18. Among the respondent 24% investors are using evaluation technique such as technical analysis & fundamental analysis.
19. Among the respondent 59% investors are use technical analysis & 41% are using fundamental analysis.
20. Among the respondent 17% investors have knowledge regarding sharpe index model.
21. Among the respondent 6% investors are using sharpe index model for portfolio management.

Conclusion

1. From the Friedman test, it can be concluded that investor give first preference to the equity, than mutual fund, than fixed deposit, than insurance, than bond & debenture, than gold & last preference give to derivative.
2. From the frequency test it can be concluded that investors objective is first preference to earn regular income & last preference to earn capital gain.
3. From the one way annova it can be concluded that investors risk regarding portfolio management there is no significant variance in gender, age, education & occupation.
4. From the one way annova it can be concluded that investors expected return regarding portfolio management there is no significant variance inage, education, occupation & annual income.
5. From the correlation it can be concluded that investors risk regarding portfolio management there is no significant variance ingender, age, education& occupation.
6. From the correlation it can be concluded that investors expected return regarding portfolio management there is no significant variance inage, education, occupation & annual income.
7. From the correlation it can be concluded that investors risk regarding portfolio management there is a correlation ingender, education& occupation.
8. From the correlation it can be concluded that investors risk regarding portfolio management there is a correlation ingender, education& occupation.
9. From the correlation it can be concluded that investors expected return regarding portfolio management there is a correlation ingender, age, education& occupation.

Suggestion

1. Less awareness regarding Sharpe index model.
2. Less awareness regarding evaluation technique for portfolio management.

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