PERFORMANCE EVALUATION OF MUTUAL FUNDS IN NEPAL A STUDY WITH REFERENCE TO EQUITY FUNDS

By

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Batch: 2019 Spring

PU Registration No: 034-2-3-00306-2019

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A thesis submitted to the Purbanchal University, Faculty of Management in partial fulfillment for the Degree of Master of Business Administration (MBA)

September, 2022

Kathmandu

DECLARATIO OF STUDENT

I, Sakib Akatar Rain declare that this thesis entitled “Performance Evaluation of Mutual Funds in Nepal, a Study with Reference to Equity Funds” is submitted in partial fulfillment of the MBA Degree of the Faculty of Management, Purbanchal University is my original work carried out under the supervision of Mr. Ajay Khadka, Vice Principal of Himalayan WhiteHouse Int’l College, and has not been submitted anywhere for the award of any other degree or commercial purpose. In keeping with the ethical practice in reporting scientific information, due acknowledgements have been made wherever the findings of others have been cited.

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This is to certify that the thesis entitled “Performance Evaluation of Mutual Funds in Nepal, a Study with Reference to Equity Funds” submitted by Sakib Akatar Rain, PU Reg. No. 034-2-3-00306-2019 to the Faculty of Management, Purbanchal University, in partial fulfillment for the award of the degree of MBA is an original research work carried out by him under my supervision. As far my knowledge, the contents of this thesis, in full or in parts, have not been submitted to any other Institution or University for the award of any degree or for any commercial purpose.

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This is to certify that Mr. Sakib Akatar Rain student of MBA, fourth semester studying in Himalayan WhiteHouse Int'l College affiliated to Purbanchal University has completed his thesis entitled **"**Performance Evaluation of Mutual Funds in Nepal, a Study with Reference to Equity Funds" as prescribed by the university standard under related subject expert's guidance. His performance during the thesis was appreciable and the report has been prepared accordingly. We appreciate his work.

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AKNOWLEDGEMENT

I take this opportunity to express my sincere appreciation to the people without whose support I would have faced insurmountable obstacles in preparation of this thesis.

First of all, I would like to thank my almighty Allah for the grace in accomplishing my thesis report within the time.

I would like to express my gratitude to our Vice Principal Mr. Ajay Khadka and Program Officer and Research Associate Mr. Manoj Subedi from the core of my heart for their kind support, guide, constructive, supervision, and instructions for providing me with all the facilities that was required.

Finally, I would also like to express special thanks to my colleagues and friends who directly or indirectly helped me a lot to complete this thesis report.

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ABBREVATIONS

AA WATBR	:	Annual Weighted Average Treasury Bill Rates
AD	:	Anno Domini
Agri	:	Agriculture
AMC	:	Assets Management Company
AMCs	:	Assets Management Companies
BM	:	Beginning Monthly
Cap	:	Capitalization
CAPM	:	Capital Asset Pricing Model
Correl	:	Correlation
e.g.	:	Example
EM	:	Ending Monthly
etc.	:	Et cetera
i.e.	:	That is
LEMF	:	Laxmi Equity Fund
MF	:	Mutual Fund
Mid	:	Medium
MPT	:	Modern Portfolio Theory
NAV	:	Net Asset Value
NEPSE	:	Nepal Stock Exchange
NICGF	:	NIC Asia Growth Fund
No.	:	Number
NRS	:	Nepalese Rupees
O	:	Outperforming
Reg.	:	Registration
Rs	:	Rupees
S.D.	:	Standard Deviation

S.N.	:	Serial Number
SAEF	:	Sanima Equity Fund
SEBON	:	Security Board of Nepal
SEF	:	Siddhartha Equity Fund
T-bill	:	Treasury Bills
U	:	Underperforming
Y/M	:	Years/Months

ABSTRACT

The AMCs invest the pooled capital into basically five funds, including money market funds, equity funds, debt funds, balanced funds, and hybrid funds that differ from their natures, such as liquidity, safety, risk, return, time horizon etc. This study aims to evaluate the performance of equity mutual funds of Nepal based on five tools of portfolio evaluation, including Sharpe's ratio, Treynor's ratio, Jensen's alpha, Fama's model, and the M-squared model. This study also attempts to compare the performance of equity mutual funds with the benchmark (NEPSE) and rank (highest to lowest, based on performance value) among the schemes to ensure whether the mutual fund is the effective (outperforming) or not, as compared to the benchmark (NEPSE). This study mostly helps the investor and portfolio manager to select the best mutual fund or equity scheme by evaluating the performance of the fund. This study has collected the data of equity mutual fund from the year 2018 to 2021 and applied Modigliani and Modigliani, i.e. M-Squared model of performance evaluation tool along with exiting one i.e. Sharpe' ratio, Treynor's ratio, Jensen's Alpha and Fama's value of net selectivity. The quantitative research methodology was used to conduct the study. While, descriptive research design was used to collect and present the facts and figures in a certain situation and interpret the situation to take action. The four equity mutual funds were taken as a sample size that has a sufficient (exactly 3 years) years of completion period. All the data was collected from secondary sources, i.e. the website of sharesansar.com, which is quantitative in nature. There is a positive relationship between annualized return and all the tools of portfolio evaluation stated above. The SAEF mutual fund scheme has the highest performance value in terms of HPR, monthly average return, beta coefficient, and annual risk and return that shows the outperforming of the portfolio within the group. Similarly, based on Treynor's ratio and Jensen's ratio, LEMF and SAEF are outperforming within the group as well as the benchmark (NEPSE). But, according to annualized return, annualized risk and the beta coefficient factors, the SAEF shows the highest performance value based on Jensen's Alpha because, it is outperforming within as well as on the benchmark. There is no any correlation between Sharpe's ratio and M-Squared value because, it provides the same correlation coefficient value across all above three factors.

CHAPERT 1: INTRODUCTION

1.1 Background of the Study

There are two ways to invest in securities one is direct method and another is indirect method. The direct method is the process of investing the assets by purchasing the securities from the security market by investor him/herself. While indirect method is the process of investing the assets by purchasing the securities through intermediaries or fund manager (Richards, 2016).

Fund Manager

The fund manager is a highly professional employee at Asset Management Company. The asset management company is also known as a mutual fund company. Asset management companies pool funds from their clients by issuing mutual fund schemes based on their goal and objective and those funds invest in various asset classes to diversify the portfolio and minimize the risk to protect the capital of their clients. In Nepal, currently there are 10 asset management companies that deal with this issue (Eldrum, 2021). The names of those companies are listed as bellows:

Table 1.1: List of Assets Management Companies and Its number of Schemes

S.N.	Name of AMC	No. of Mutual Funds Schemes
1	CIBL Capital Limited	2
2	Global IME Capital Limited	1
3	Laxmi Capital Market Limited	2
4	Nabil Investment Banking Limited	2
5	NIBL Ace Capital Limited	3
6	NIC Asia Capital Limited	3
7	NMB Capital Limited	2
8	Sanima Capital Limited	2
9	Siddhartha Capital Limited	2
10	Sunrise Capital Limited	1
	Total	**20**

Source: (Eldrum, 2021)

Benefit for Investing in Mutual Fund

A mutual fund can make money from its securities in two ways: a security can pay dividends or interest to the fund or a security can rise in value. A fund can also lose money and drop in value. The reduced risk of portfolios comes from the benefits of

diversification provided by mutual fund managers for investors (Howells & Bain, 2005, p. 63).

Mutual Fund Scheme

A mutual fund scheme is a product of an asset management company that offers its clients to purchase this product as an investment. After selling this product, the funds are pooled by the AMC and invested in the various asset classes. The AMCs provide the return to its client as per mutual scheme type and objective of the scheme. In Nepal, currently there are twenty mutual funds schemes that are registered with SEBON across all the AMCs mentioned in the following table below:

Table 1.2: List of Mutual Funds Schemes

S.N.	Name of Mutual Funds Schemes
1	Sanima Large Cap Fund (SLCF)
2	NMB 50 Fund (NMB50)
3	Sanima Equity Fund (SAEF)
4	Nabil Equity Fund (NEF)
5	Laxmi Equity Fund (LEMF)
6	Siddhartha Equity Fund (SEF)
7	Laxmi Unnati Kosh (LUK)
8	NIBL Pragati Fund (NIBLPF)
9	NIC Asia Growth Fund (NICGF)
10	Siddhartha Investment Growth Scheme - 2 (SIGS2)
11	NIBL Sambriddhi Fund-1 (NIBSF1)
12	Global IME Samunnat Scheme-1 (GIMES1)
13	Sunrise First Mutual Fund (SFMF)
14	NIC Asia Balance Fund (NICBF)
15	Nabil Balanced Fund-2 (NBF2)
16	NMB Hybrid Fund L-1 (NMBHF1)
17	Citizens Mutual Fund-1 (CMF1)
18	Citizens Mutual Fund-2 (CMF2)
19	NIC Asia Dynamic Debt Fund (NADDF)
20	NIBL Sahabhagita Fund (NIBLSF)

Source: (Eldrum, 2021)

Types of Mutual Fund Schemes

Basically, there are two types of mutual fund schemes. One is open-ended schemes and another is closed-ended schemes. The open-ended schemes are those schemes

which are not tradable on the stock exchange instead of tradable with AMCs based on a daily NAV determined by a fund manager. The close-ended schemes are those schemes which are tradable on the stock exchange based on the latest NAV determined by demand and supply of the share market. In Nepal, currently there are 2 open-ended funds, NADDF and NIBLSF, and 18 closed-ended funds out of 20 mutual fund schemes in Nepal (Eldrum, 2021).

History of Mutual Fund

The history of mutual fund in Nepal started with the establishment of "NCM Mutual Fund 1993" by Nepal Industrial Development Corporatio (NIDC) Capital Market in 1993. The term of the NCM Mutual Fund 1993 was completed in 2001 and it was converted into close-end fund in the name of "NCM Mutual Fund, 2002" in 2002 (Thapa & Rana, 2011).

Regulatory Body for AMC

The establishment of Securities Board of Nepal (SEBON) as the apex regulatory body for the securities markets in 1993 and the subsequent formulation and enactment of Securities Act, 2006, Mutual Fund Regulations Act, 2010 and Securities Businessperson (Merchant Banker) Regulations,2008 have enabled proper licensing, monitoring, supervision and regulation of mutual fund alongside investment banking activities In Nepal (Shrestha & Shrestha, 2020).

Parties involved in Mutual Fund

In Nepal, there are four parties involved in Mutual Fund as per MF regulation Neal, 2067 (2010). They are Fund Sponsor, Fund Manager, Fund Supervisor and Depository. The fund Sponsor is an institution that has paid up capital of NRS 1 billion and at least 5 years of operatio along with continuously earned profit in the last 3 years. The fund manager and depository are also known as asset management companies, having paid up capital of NRS 100 million and at least 51% stake of the fund supervisor along with licensed by SEBON. The fund supervisors are the group of at least 5 people having the expertise, clean records, required qualification and experiences in various institutions. Example:

Table 1.3: Parties involved in Mutual Fund

Fund Sponsor	Fund Manager & Depository	Fund Supervisors	Name of Scheme
Sanima Bank Limited	Sanima Capital Limited	1. CA Tirtha Raj Upadhyay 2. Dr. Hemanta Kumar Dabadi 3. Mr. Madhav Prasad Dhakal 4. Mr. Lalit Bahadur Basnet 5. Mr. Khyam Narayan Dhakal	Sanima Equity Fund

Source: (Sanima Capital, 2020)

Intrinsic Value or Par Value of Mutual Fund Scheme

The mutual fund units are sold on a lot basis rather than per unit basis. Although the par value of each unit of mutual fund for both (open-ended and closed-ended) schemes is Rs.10 as a NAV in Nepal. This par value is applicable when the mutual fund scheme is launched for the first time on the market.

Net Assets Value (NAV) Per Unit

The Net Asset Value (NAV) per unit is the price of the mutual fund in terms of per unit that is applicable for buying and selling the mutual fund scheme in the security market. The NAV value is determined on a daily basis by the open-ended scheme by using the following formula presented below.

Table 1.4: Formula of NAV Per Unit

$$\text{NAV Per Unit} = \frac{\text{Total Assets -Current Liablities}}{\text{Total No. of Unit Holders}}$$

Where,

- **Total Assets** = Investment in Securities + Current Assets

  Investment in Securities = Investment in Listed Shares + Investment in IPO/Right Shares/Bonus Share + Bank Fixed Deposit +Bonds/Debentures

  Current Assets = Bank Balance + Other Assets

- **Current Liabilities** = Other Liabilities +Planning Management & Depository Fees +Fund Supervision Fees

Source: (Sanima Capital, 2077)

Cost of Investing in Mutual Fund

There are four types of costs related to mutual funds applicable based on their schemes (open-ended or closed-ended). These costs can be presented in table 1.5 below..

Table 1.5: Cost of Investing in Mutual Funds

Cost	Sub-Costs	Open-Ended Fund	Closed-Ended Fund
i. Entry Load	-	None	None
i. Brokerage Commission	a) Front-End Load b) Back-End Load	a) DP Charge b) DP Charge + CGT	a) All Commission Costs b) All Commission Costs
ii. Operating Expenses	a) Fund Management Fees b) Depository Fees c) Supervisor Fees	a) 1.25% of applicable NAV b) 0.20% of applicable NAV c) 0.12% of applicable NAV	a) 1.75% of applicable NAV b) 0.20% of applicable NAV c) 0.12% of applicable NAV
iii. Exit Load	a) Up to 6 months b) 6-12 months c) 12-18 months d) 24 months+	a) 1.5% of applicable NAV b) 1.25% of applicable NAV c) 1% of applicable NAV d) 0.75% of applicable NAV +	None

Source: (Sanima Capital, 2077)

In the above table 1.5, the entry load is none in both open-ended and closed-ended funds. Under the brokerage commission, the front-end load (also known as purchase cost) is applicable for both open-ended and closed-ended funds. For an open-ended fund, the DP charge is only incurred, while for a closed-ended fund the front-end load includes DP charge, brokerage commission, SEBON fees and capital gain tax.

Similarly, the back-end load (also known as selling cost) is applicable for both open-ended and closed-ended funds. For an open-ended fund, the DP charge and capital gain tax are only incurred, while for a closed-ended fund, the front-end load includes DP charge, brokerage commission, SEBON fees and capital gain tax. Under the operating expenses there were three costs mainly incurred, including fund management fees, depository fees and supervisor fees. These costs are applicable for both open-ended and closed-ended funds with either the same or different costs of the fund. The exit loads are only applicable for open-ended funds that will be based on the holding period.

Investment Nature of AMCs

The AMCs invest the pooled capital into basically five funds that differ from its nature, including liquidity, safety, risk, return, time horizon etc. These funds may be presented as bellows:

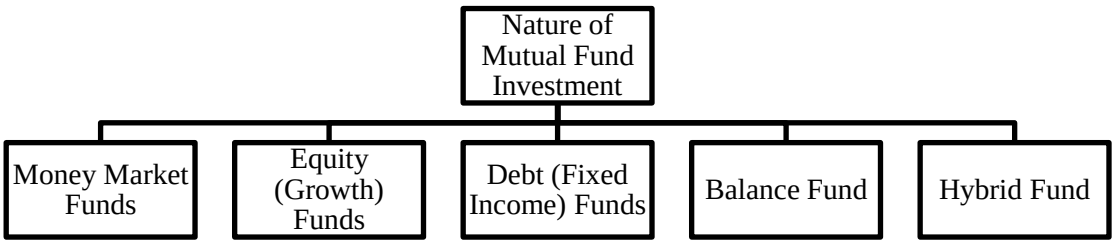

Figure 1.1: Nature of Mutual Fund Investments

Source: (HDFC Fund, 2021)

In figure 1.1, there are five types of mutual fund investment by AMCs. The money market funds are short-term debt instruments like T-bills. Equity or growth funds are one of the most popular funds. They allow investors to participate in stock markets. Debt or fixed income funds are fixed coupon bearing instruments like government securities, bonds, debentures etc. Balance funds are the funds that divide their investment between equity and debt. Similarly, hybrid funds are the funds that divide all of their investment among all the other funds above.

Operatio Flow of AMC

The mutual fund company operates its business through certain steps starting from pooling the money from the investor and ending with providing the returns back to the investor after deducting the necessary charges as per mutual fund rules & regulations. The returns are distributed to the unit holder as per their proportion of the total fund. The operatio cycle of a mutual fund is shown in figure 1.2 below.

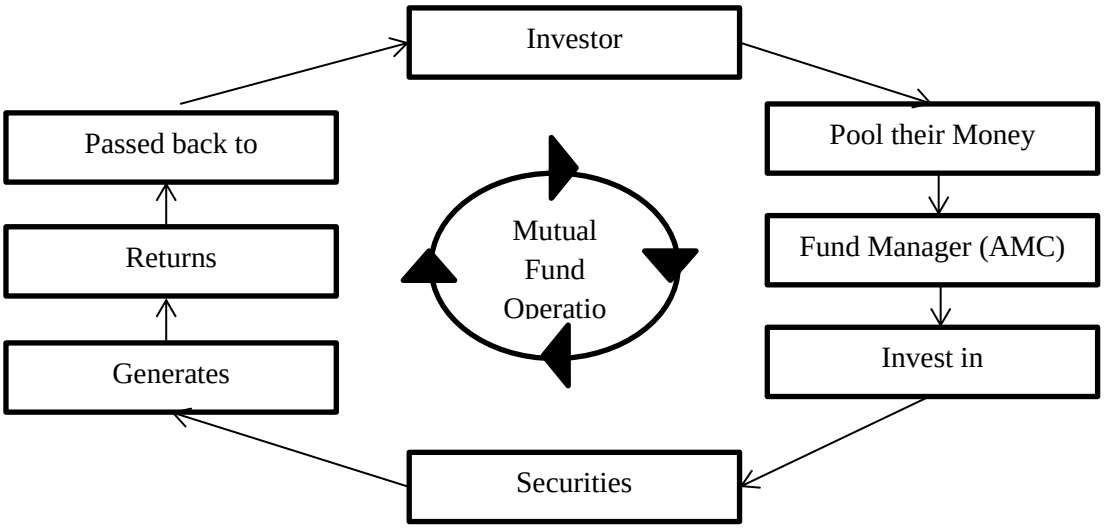

Figure 1.2: Operatio Flow of Mutual Fund

Source: (Maruti, 2015)

1.2 Statement of the Problem

The performance evaluation of a portfolio is a very sensitive task for fund managers and investors because it provides the result of the portfolio that changes the mindset of the people towards the investment in a particular asset. So, after reviewing a number of literature, the researchers found that the result of the portfolio that the previous researchers were done which is acceptable in a particular time frames with particular tool for particular scheme at a particular place i.e. location.

But the same result will come at any point in time which is not necessary. The time frame could affect the result of the portfolio and the type of portfolio (scheme) could also lead to the performance of the portfolio. Sometimes, use of a different tool (not used yet) might help to evaluate the performance of the portfolio and interpret the result.

So the purpose of this study is to evaluate the performance of mutual fund schemes (portfolio) with reference to equity funds in a new time frame by using additional tools (M-Squared Model) with existing ones that help to fill the gap. The study first

measured the performance of the MF and evaluated the overall performance results by comparing it with the benchmark index (NEPSE) and ranking among the schemes to ensure the effectiveness (outperforming) of the portfolio.

1.3 Objective of the Study

1.3.1 Primary and Specific Objectives

The primary objective of this study is to evaluate the overall performance of equity mutual funds in Nepal to ensure the effectiveness (outperforming) of the portfolio. While the secondary objectives of the study are stated below:

i. To measure the performance of the portfolio by using portfolio evaluation tools, that includes Sharpe's ratio, Treynor's ratio, Jensen's alpha, Fama's model, and the M-squared model.
ii. To compare the performance of a portfolio within a group as well as with a benchmark (NEPSE) by using a rank (from highest to lowest, based on measured performance value) method

1.4 Significance of the Study

This study is important for the following groups and individuals:

i. **Investor:** This study helps the investor to select the best mutual funds scheme by evaluating the performance of the mutual fund
ii. **Assets Management Company:** This study guides and encourages the AMC to make and adjust the appropriate strategy to make the best investment decision on a particular mutual fund scheme that helps to manage the risk.
iii. **SEBON:** This study also informs the regulatory body about the particular mutual fund scheme and whether this scheme is able to generate a fair return for the investor or not. So, based on that condition, the authorities can provide appropriate advice or suggestions to the AMC for appropriate action.

1.5 Scope of the Study

The main purpose of the study is to evaluate the overall performance of equity mutual funds in Nepal, which shows the effectiveness of the portfolio with the benchmark index (NEPSE return) and among the schemes. This study is based on the context of Nepalese mutual in the security market. All the data has been collected from

secondary source instruments, including websites and research papers, and from the year 2018 to 2021. The Sharpe's ratio, Treynor's ratio, Jensen's Alpha, Fama's measure, and M-squared tools were used to analyze the data and evaluate the performance of the mutual fund with the help of a quantitative research approach and descriptive research design.

1.6 Limitation of the Study

This report holds within the following limitations and constraints such as:

i. **Equity Instruments:** This study was done based on an equity-oriented mutual fund scheme in Nepal. Although there are basically three types of investment fund instruments, they include equity, debt and hybrid or balanced funds.
ii. **Sample Size:** This study has taken four mutual funds schemes under the equity fund category from four different asset management companies, which are very small samples to evaluate the overall performance of the equity mutual fund for the stakeholders.
iii. **Data Collection Size:** This study has taken three years monthly data (36 months NAV) from selected schemes with respect to four AMC related to the scheme.
iv. **Location:** This study was conducted in the context of Nepal. Hence, it does not suggest any advice about all the equity-oriented schemes, whether it is good or bad for investment purposes.

CHAPERT 2: REVIEW OF LITERATURE

2.1 Conceptual Review

An investment is an asset bought by an individual or organization with the expectation that it will generate some future income or profit—Examples of investments may include stocks and real estate (Robinhood, 2021).

Basically, the whole assets can be categorized into two parts, as real assets and financial assets. The real assets are those assets which can be touched and kept physically in any place. It is also known as tangible assets. For example, property, land, buildings, etc. Financial assets are those assets which cannot be touched and stored in boxes. These assets are intangible in nature and they include bank deposits, marketable securities (treasury bills, commercial bills, certificates of deposits), investment in shares, investment in bonds (government and corporate bonds), debentures etc.

Whenever we talk about the term ‘buy’ or ‘sell’, it highlights the market, because the market deals with all the activities of buying and selling goods or services in exchange for money. So, basically, the market is a place where buyers and sellers meet to exchange their goods and services for monetary benefits.

The market can be categorized into various bases, like based on geography, based on time, based on nature of transactions, based on regulatory, based on competition etc. Every market deals with business transactions between parties properly based on its nature and rules and regulations. In this study, the regulatory market will be discussed because this type of market deals with the financial transactions between parties. It is also known as the financial market.

The financial market deals with basically two assets, such as securities and commodities. The securities can be purchased in two ways, one from the money market and another from the secondary market. The money market sells the short term (less than 1 year) securities while the capital market sells the long-term (more than 1 year) securities (Magnet, Brains, 2021) .

The capital market is further divided into two parts. One is the primary market, another one is the secondary market. The primary market deals with new issues of

securities while the secondary market deals with existing or already listed securities on the stock exchange.

In the same way commodities market deals with natural commodities rather than artificial commodities through derivatives. The natural commodities can be categorized into two parts one is agri-commodities include rice, paddy, onion, potatoes, etc. and another is non-agri commodities include precious metals (Gold, Silver, Platinum), base metals (Steel, Copper, Zinc, Aluminum and Nickel) and Energy (Crude Oil, Thermal Oil, and Natural Gas) (Qdigita, 2020).

Mutual fund is basically a company that pools the money from a group of investors (its shareholders) to buy financial securities, building a less risky portfolio than an individual investor would do (Kolosov & Soltanmammedov, 2011). In other words, a mutual fund is a company that invests in a various securities to build the diversified portfolio.

A portfolio (financial portfolio) is simply a collection of securities. The securities could be either debt securities or equity securities or combination of both securities. A collection of various stocks is known as equity portfolio. Similarly, if you've invested all your money into debt securities like bond, debentures, fixed-deposit account etc. this collection of securities is known as debt portfolio. A portfolio which has the combination of equity securities and debt securities is known as hybrid portfolio. The mutual fund is a very good example of financial portfolio (Investopedia, 2021).

The mutual fund theorem is the use of mutual fund investments in the building of a comprehensive portfolio. The mutual fund theorem was introduced by James Tobin, who worked alongside Harry Markowitz from 1955 to 1956 at the Cowles Foundation at Yale University. The mutual fund theorem follows the principles of modern portfolio theory, which Markowitz studied at the Cowles Foundation (Chen, 2020).

The Modern Portfolio Theory (MPT) refers to an investment theory that allows investors to assemble an asset portfolio that maximizes expected return for a given level of risk. The theory assumes that investors are risk-averse; for a given level of expected return, investors will always prefer the less risky portfolio (Corporate Finance Institute, 2021).

An investor must be compensated for a higher level of risk through higher expected returns. MPT employs the core idea of diversification – owning a portfolio of assets from different classes is less risky than holding a portfolio of similar assets.

Diversification is a portfolio allocation strategy that aims to minimize idiosyncratic risk (unsystematic risk) by holding assets that are not perfectly positively correlated. Actually, the total risk can be divided into two parts. One is systematic risk (market risk) and another is unsystematic risk (non-market risk).

Systematic risk is a part of total risk and associated with market return. It is denoted by the beta symbol. It is also known as non-diversifiable risk. There are various macroeconomic variables (inflation rate, exchange rate, interest rate, etc.) leading to the systematic risk. Similarly, unsystematic risk is another part of the total risk and is associated with company or industry-specific risk. It is also known as diversifiable risk. There are various companies or industry variables (business risk, credit risk, product risk, legal risk, operatioal risk, liquidity risk etc.) leading to the unsystematic risk. (Investopedia, 2021).

Portfolios can be diversified in a multitude of ways, such as assets can be from different industries, different asset classes, different markets (i.e., countries), and from different risk levels to minimize unsystematic risk.

If there is negative correlation among the assets in the portfolio, then it can be considered as a good example of diversification and expect a good performance of the portfolio.

The portfolio evaluation is the performance appraisal of a portfolio. It compares the actual return with the return of the benchmark index. The result of the performance evaluation of the portfolio provides one condition among three conditions, including outperforming, underperforming and performing as expected. There are various models related to performance evaluation of the portfolio developed by different theorists. Some of the popular models can be discussed as follows. .

Sharpe (1966) evaluates performance of mutual funds using concept from modern portfolio theory. He has developed a composite measure that considers return and risk. He evaluated the performance of 34 open-end mutual funds during the period 1944-1963. He concluded that the average mutual fund performance was distinctly

inferior to an investment in the DJIA (Dow Jones Industrial Average). It was also revealed that good performance was associated with low expense ratio and only low relationship was discovered between fund size and performance.

Treynor & Mazuy (1966) 's study found that none of the investment managers of the 57 funds (1953-1962) outguess the market and that these managers should not be held responsible for failing to anticipate changes in market direction.

Jensen (1969) developed portfolio evaluation model including risk aspects explicitly by utilizing and extending theoretical results by Sharpe (1964) and Lintner (1965) on the pricing of capital assets under uncertainty. The result convey that measure of portfolio performance (which measures only a manager's ability to forecast security prices) is defined as the difference between the actual returns on a portfolio in any particular holding period and the expected returns on that portfolio conditional on the riskless rate, its level of systematic risk, and the actual returns on the market portfolio. Criteria for judging a portfolio's performance to be neutral, superior, or inferior are established.

Fama (1972) introduced a model for evaluating investment performance of managed portfolios. He suggested that the overall performance of managed portfolios could be broken down into several components. He argued that the observed return of a fund could be, due to the ability of fund managers, to pick up the best securities at a given level of risk (their selectivity ability). Some portion of this return could also arise due to the prediction of general market price movements (their market timing ability).

Modigliani and Modigliani (1997) showed that the portfolio and its benchmark must have the same risk to be compared in terms of basis points of risk-adjusted performance. So they propose that the portfolio be leveraged or deleveraged using the risk-free asset. This measure evaluates the annualized risk-adjusted performance of a portfolio in relation to the market benchmark, expressed in percentage terms.

2.2 Review of the Related Studies

A number of studies have been done on the related topic "performance evaluation of mutual funds" at national and international level. The section presents a brief review by separating the nature of the paper.

2.2.1 Review of Journals Articles

Upadhyaya and Chhetri (2019) evaluate the performance of 8 mutual fund schemes with the objective of analyzing the returns earned by the sample mutual funds, benchmarking with market returns and assessing whether they are taking advantage of diversification, market timing and selectivity of securities for their investors. The monthly NAV was collected from the year 2015 to 2018 with the help of a secondary source of data collection using a descriptive research design. The researchers used Jenson (1968), Treynor (1965), Sharpe (1966), Fama (1972), Treynor and Mazuy (1966) as data analysis tools. It concluded that over the research period mutual funds over-performed on the benchmark market index and it depicted a low amount of diversification, a moderate level of selectivity and no significant relationship between timing skill and return of funds.

Bajracharya (2016) evaluate the performance of 5 mutual fund schemes with the objective of evaluating the performance of mutual funds compared to benchmark returns and, along with presenting an extensive analysis of the factors which impact the price. The monthly returns were collected for the last 30 months and 12 months with the help of a secondary source of data collection. The researchers used Jenson, Treynor, Sharpe, statistical models and financial mode like CAPM as data analysis tools. The Treasury bill was taken for considering the risk free rate. It is found that most of the mutual funds have performed better according to Jenson and Treynor measures but not up to the benchmark on the basis of the Sharpe ratio. However, few mutual funds are well diversified and have reduced their unique risk.

Gruber (1996) in his article based on USA data claims that most of the older studies are subject to survivorship bias. When this effect is adjusted, is argued that mutual funds on average under-perform the market proxy by the amount of expenses they charge the investors.

Otten and Bams (2004) in article titled "How to measure mutual fund performance: economic versus statistical relevance" says that the majority of US studies conclude that actively managed portfolios, on average, under perform market indices. He quoted the examples of the studies conducted by Jensen (1968) and Sharpe (1966). He argued mutual funds underperform the market by the amount of expenses they charge the investors.

2.2.2 Review of Prepared Thesis

Maruti (2015) evaluate the performance of 5 AMC with the objective of evaluating growth fund schemes in terms of its categorization as Large cap, Large & Mid Cap, Multi Cap and Mid & Small cap funds and preparing the selected profile of the AMC with their product to gain the comprehensive understanding about the mutual fund. It also offered the feasible suggestions in the light of finding. All the data were collected from the year 1st April 2007 to 31st March 2013 with the help of secondary sources include published records of Association of Mutual Funds of India (AMFI), Value Research website, respective Asset Management Companies (AMCs) websites, journals, magazines, CMIE Reports and Prowess database. The researcher was used Treynor's measure, Sharpe's measure, Jensen's differential return measure, Fama's decomposition measure and M-squared measure to rank the portfolio and compare with the benchmark index. The bank rate was taken for considering the risk free rate. It found that the efficiency of fund managers needs to be improved to sense the changing market environment and incorporate appropriate portfolio trimming strategies in order to ensure superior performance.

Gupta and Gupta (2001) in their studies on Indian mutual funds industry investigated that on September 30, 1999 total assets under the management of mutual fund industry stood at Rs 85,487 crore (Rs 850 billion). Furthermore that the mutual fund industry has four types of players i.e. (1) UTI; (2) public sector banks; (3) insurance corporatios; and (4) private sector funds. These four types consist of 37 players, 11 are in the public sector including UTI, and the remaining ones are the private sector. The UTI alone accounts for Rs 63, 113 crore which is 74 percent of total assets of the industry. The share of other public sector funds is Rs 8831 crore that is 10.2 percent of total funds in the industry. The remaining resources of Rs 13, 543 crore that is 15.8 percent are available to the private sector funds. Total number of schemes offered by all funds is 311 out of which 182 are closed-ended; and 142 are open ended.

El-Khouri (1993) in his studies conducted on Risk-Return Relationship based on Amman Stock Exchange data concluded that debt equity ratio appears to be insignificantly correlated to required return in all regression.

Shah and Hijaz (2005) founds Pakistani Mutual Fund industry's Sharpe ratio is 0.47 as compared to market that is 0.27 risk premium per one percent of standard deviation. Results of Jensen differential measure also show positive after cost alpha. Hence overall results suggest that mutual funds in Pakistan are able to add value. Whereas results also show some of the funds under perform, these funds are facing the diversification problem. They was used various tools of portfolio evaluation such as 1) Sharpe Measure (2) Treynor Measure (3) Jenson differential Measure and (4) Fama French Measure. All the data were collected from annual reports of equity and balanced funds for the period from 1997 to 2004. They were used rests of 14 funds out of total 33 funds have lived a long life and still operative which serve our research purpose.

2.2.3 Review of Research Report

Rauniyar (2016) evaluate the performance of 6 mutual fund scheme with the objective of evaluating and comparing the performance of closed end mutual fund scheme and management effectiveness of closed end mutual fund in Nepal for the purpose of benefitting mutual fund manager and investors. All the monthly data were collected from the year 2012 to 2016 with the help of secondary source of data collection includes website of respective mutual fund scheme manager. The researcher was used Treynor ratio and regression model data analysis tools. The researcher was used Treynor ratio return as dependent variable and assets, expenses, turnover, age, liquidity and lag of Treynor ratio return as independent variables. The result indicates that among various fund attributes lagged return, liquidity and asset have significant impact on mutual fund performance.

Otten and Bams (2002) Maastricht University, in 2002 carried a research on European mutual funds. Results suggest that Europeans mutual funds especially small capitalization funds are able to add value. If the management fee is added back, some exhibits significant out performance. The author also pointed out that European mutual funds industry is still lagging behind the US industry both in total assets size and market capitalization.

Malkiel and Radisich (2001) finds that index funds have regularly produced rates of return exceeding those of active funds by 100 to 200 basis points per annum

in the United States over the 1990s and find that there are two reasons for the excess performance by passive funds: management fee and trading costs.

Wermers (2000) carried out a research on mutual funds' performance in America and found that funds hold stocks that outperform by market 1.3 percent per year, but their net results underperform by one percent. Out of this 1.6 percent is due to expense and transaction costs.

Blake and Timmermann (1998) University of California, carried out a research in 1998 on performance evaluation of UK mutual funds and found that the average UK equity fund appears to underperform by around 1.8 percent per annum on a risk-adjusted basis. The authors says that there is also some evidence of persistence of performance, on average, a portfolio composed of the historically best-performing quartile of mutual funds performs better in the subsequent period than a portfolio composed of the historically worst-performing quartile of funds.

Bauer, Koedijk, and Otten (2002) They conducted research using an international database containing German, UK and US ethical funds remarked that the existing empirical evidence on US data suggests that ethical screening leads to similar or slightly less performance relative to comparable unrestricted portfolios. Evidence on the performance of ethical mutual funds is mostly limited to the US and UK markets. For UK market four influential papers appeared during the last decade. The early studies compared ethical funds to market wide indices like the FT all share index. Using this methodology Luther, Matatko and Corner (1992) investigated the returns of 15 ethical unit trusts. Their results provided some weak evidence that ethical funds tend to outperform general market indices.

Kothari (1997) found that the results indicate that procedures based on the Fama-French 3-factor model are somewhat better than CAPM based measures. He was used stratified-random stock portfolios. He was used Sharpe measure, Jensen alpha, Treynor measure, appraisal ratio, and Fama-French three-factor model alpha method.

2.3 Theoretical Framework

Performance evaluation is the last step of Modern Portfolio Theory. This theory consists of five steps, such as measuring the risk and return of the security, allocating investment weight to securities, diversification of investment, high return security in the portfolio and evaluating the performance of the portfolio.

The performance evaluation of mutual funds is a matter of concern to fund managers, investors and researchers. It helps to improve the investment decision making and management process. It communicates the portfolio manager's results. The portfolio can be evaluated by using its tools, including Sharpe's ratio, Treynor's ratio, Jensen's alpha, Fama's value and M-squared value. This study attempts to answer the following research question stated below.

Research Question: "What are the factors or parameters that affect the performance value of an equity mutual fund scheme (portfolio) in Nepal as per performance evaluation tools of a portfolio that help to ensure whether the portfolio or mutual fund is effective (outperforming) or not as compared to the benchmark (NEPSE)?"

So, to answer the above research question, a researcher identified the various parameters related to portfolio evaluation tools stated above that affect the value of portfolio performance. These factors are presented with the help of a theoretical framework. The theoretical framework is based on theories or general representation of relationships between various things (variables). So, based on this framework, the variables are presented in figure 2.1 below.

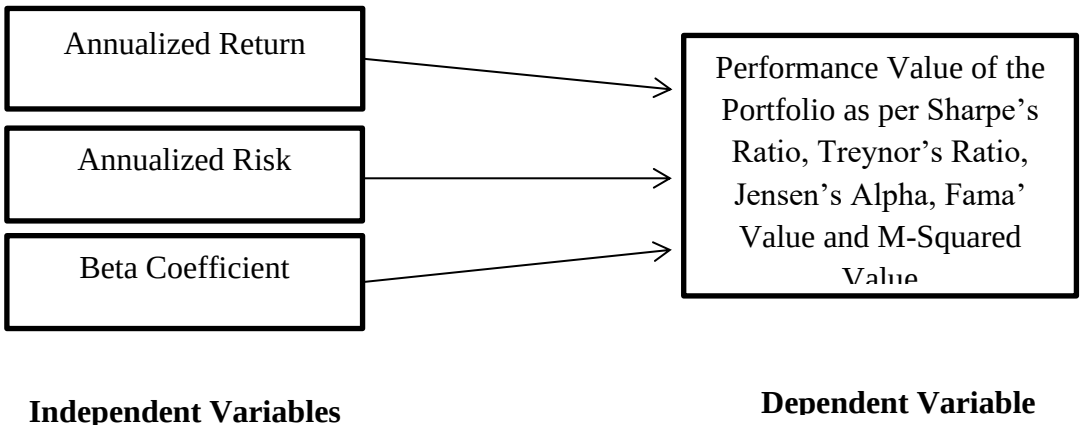

Figure 2.1: Theoretical Framework

i. **Annualized Return:** An annualized total return is the geometric average amount of money earned by an investment each year over a given time period. The annualized return formula is calculated as a geometric average to show what an investor would earn over a period of time if the annual return was compounded (Investopedia, 2022).
ii. **Annualized Risk** An annualized total risk is measured by standard deviation which is derived from the variability of returns for a series of time intervals adding up to the total performance sample under consideratio (Investopedia, 2022).
iii. **Beta Coefficient:** Beta coefficient is a measure of the systematic risk of a security or a portfolio in comparison to the market. It is calculated as the covariance of the security's returns with the returns of the market divided by the variance of the market. A beta of 1 indicates that the security's returns move exactly with the market. A beta of less than 1 indicates that the security's returns are less volatile than the market and a beta of greater than 1 indicates that the security's returns are more volatile than the market (Casual, 2022).
iv. **Performance Value of Portfolio (Mutual Fund Scheme):** The performance value of the portfolio is the resulting value, which comes from after calculating any ratio of portfolio evaluation such as Sharpe's ratio, Treynor's ratio, Jensen's alpha, Fama's value and M-squared value.

Hypothesis formulation

Hypothesis formulation is not a necessary but an important step of the research. A hypothesis is a possible answer to a research question. It is a presumption or a hunch on the basis of which a study has to be conducted. This hypothesis is tested for possible rejection or approval. If the hypotheses get accepted it shows that your hunch was right if it get rejected it still does not mean that your research was not valid, but it means that it is the opposite way you thought and perceived. Whether it is approved or not it gives you some conclusion and adds to the available body of knowledge (Sahifa, 2022). As per the above parameters or factors shown in the theoretical framework figure 2.1, the researcher has formulated the following hypothesis stated below.

- **H0: There is no any or negative relationship between annualized return and performance value of the portfolio as per portfolio evaluation tools**

- H1: There is a positive relationship between annualized return and performance value of the portfolio as per Sharpe's ratio
- H2: There is a positive relationship between annualized return and performance value of the portfolio as per Treynor's ratio
- H3: There is a positive relationship between annualized return and performance value of the portfolio as per Jensen's Alpha
- H4: There is a positive relationship between annualized return and performance value of the portfolio as per Fama's Value
- H5: There is positive relationship between annualized return and performance value of portfolio as per M-Squared Value

- **H0: There is no any or negative relationship between annualized risk and performance value of the portfolio as per portfolio evaluation tools**
- H1: There is a positive relationship between annualized risk and performance value of the portfolio as per Sharpe's ratio
- H2: There is a positive relationship between annualized risk and performance value of the portfolio as per Treynor's ratio
- H3: There is a positive relationship between annualized risk and performance value of the portfolio as per Jensen's Alpha
- H4: There is a positive relationship between annualized risk and performance value of the portfolio as per Fama's Value
- H5: There is positive relationship between annualized risk and performance value of portfolio as per M-Squared Value

- **H0: There is no any or negative relationship between beta coefficient and performance value of the portfolio as per portfolio evaluation tools**
- H1: There is a positive relationship between the beta coefficient and the performance value of the portfolio as per Sharpe's ratio
- H2: There is a positive relationship between the beta coefficient and the performance value of the portfolio as per Treynor's ratio
- H3: There is a positive relationship between the beta coefficient and the performance value of the portfolio as per Jensen's Alpha

- H4: There is a positive relationship between the beta coefficient and the performance value of the portfolio as per Fama's Value
- H5: There is a positive relationship between the beta coefficient and the performance value of the portfolio as per M-Squared Value

2.4 Research Gap

Well, after reviewing a number of literature related to this study, this study found that there were fewer (around 3 to 4) numbers of researchers have been conducted the study on performance evaluation of mutual funds in Nepal. So, based on the reviewed literature, all the researchers have conducted studies on the old period (i.e., in the range of 2007 to 2016) at national and international level in the context of Nepalese mutual funds. Another thing is that the entire previous Nepalese researcher had skipped the Modigliani and Modigliani i.e. The M-Squared model of performance evaluation is also one of the best tools for evaluating the performance of a portfolio. Not any researchers have studied new schemes of mutual funds (i.e. new equity mutual funds schemes) that are currently (year 2021 AD) running in Nepal.

CHAPERT 3: RESEARCH METHODOLOGY AND DESIGN

3.1 Research Methodology

The quantitative research methodology was used to deal with numbers and help to measures various statistics such as average, variance, standard deviation, coefficient of standard deviation and any specific formulas.

3.2 Research Design

The descriptive research design was used to collects and presents the facts and figures in a certain situation and interprets the situation to take the action.

3.2.1 Population and Sample Size

The total numbers of currently running mutual fund schemes were used for representing the population of this study. The stratified sampling method was used to stratify (classify) the population based on similar (homogeneous) characteristics into different strata, such as debt, equity and hybrid funds. The arbitrary approach, i.e., use of the fixed percentage method was used to determine the sample size for this study. The researcher took 36% of the total number in the equity strata to determine the same size. A sample list of mutual fund schemes was selected after determining the sufficient (exactly 3 years) years of completion period i.e. from the date of launch of the equity schemes to the research conducted.

Table 3.1: List of Samples Name with Basic Details

Name of Mutual Fund Scheme	Fund Sponsor	Fund Manager & Depository (AMC)	Scheme Type	Maturity Period	Maturity Date	Fund Size (Rs)
Sanima Equity Fund (SAEF)	Sanima Bank Ltd	Sanima Capital Limited	Closed-ended Fund	7	12/26/2024	1.30 Arba
Laxmi Equity Fund (LEMF)	Laxmi Bank Ltd	Laxmi Capital Market Limited	Closed-ended Fund	7	6/12/2024	1.25 Arba
Siddhartha Equity Fund (SEF)	Siddhartha Bank Ltd	Siddhartha Capital Limited	Closed-ended Fund	10	11/8/2027	1.5 Arba
NIC Asia Growth Fund (NICGF)	NIC Asia Bank Ltd	NIC Asia Capital Limited	Closed-ended Fund	7	3/11/2025	85 Crore

Source: (Nepse Khabar, 2021)

3.2.2 Sources and Nature of Data

The secondary sources of data collection were used using a cross-sectional data method because it collects the data at once over a period of years, so the daily NAV was collected and converted into monthly NAV (ending NAV for each month of the year) for this study. The collectible data was quantitative in nature because the data is already in the form of a quantitative form and it can also be easily measured in terms of numbers or amounts.

3.2.3 Instrumentation of Data Collection

The data were collected through various data collection instruments under secondary sources such as website (sharesansar.com) and research paper.

3.3 Data Analysis Tools and Methods

The portfolio performance was evaluated through its own tools presented in figure 3.1 and interpreted the effectiveness of the portfolio based on its performance (result) through the rank and comparison method. All the collected data was classified, summarized, adjusted, analyzed and evaluated through Microsoft Excel 2010 software.

3.3.1 Portfolio Performance Evaluation Tools

There are various portfolio performance evaluation tools. Some of the most popular models were used to evaluate the performance of the selected mutual fund in this study, which provides whether the portfolio is outperforming, underperforming or performing as expected from the benchmark and within the portfolio.

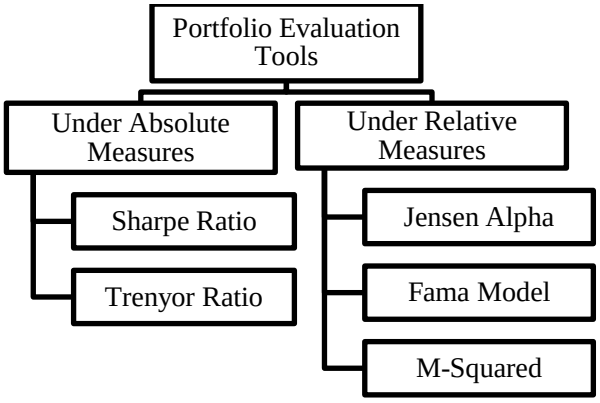

Figure 3.1: Tools of Portfolio Evaluation

Source: (Sourd, 2007)

Under Absolute Measures

Absolute measures evaluate fund's risk adjusted returns, without any reference to a benchmark (Sourd, 2007). It provides basically two tools include Sharpe ratio (reward to variability ratio) and Treynor ratio (reward to volatility ratio). The formula of each ratio can be expressed as:

a) Sharpe Ratio

This ratio is compared the risk premium (excess return) to the total risk denoted by standard deviation (sigma). The Sharpe ratio can be expressed for both portfolio and market as:

Table 3.2: Formula of Sharpe Ratio

	Portfolio	**Market**
Sharpe Ratio	$\frac{(K_p - K_{RF})}{\sigma_p}$ Where, K_p=annual portfolio return K_{RF}=annual risk-free rate σ_p=standard deviation of portfolio	$\frac{(K_m - K_{RF})}{\sigma_m}$ Where, K_m=annual market return K_{RF}=annual risk-free rate σ_m=standard deviation of market

Decision: If the Sharpe ratio of the market is greater than the Sharpe ratio of the portfolio, it can be said as underperforming. It provides the excess return per unit of total risk. The higher the ratio is the better.

b) Treynor Ratio

This ratio is compared the risk premium (excess return) to the systematic risk denoted by beta (β). The Treynor ratio can be expressed for both portfolio and market as:

Table 3.3: Formula of Treynor Ratio

	Portfolio	**Market**
Treynor Ratio	$\frac{(K_p - K_{RF})}{\beta_p}$ Where, K_p=annual portfolio return K_{RF}=annual risk-free rate β_p=beta coefficient of portfolio	$\frac{(K_m - K_{RF})}{\beta_m}$ Where, K_m=annual market return K_{RF}=annual risk-free rate β_m=beta coefficient of market

Decision: If the Treynor ratio of the market is less than the Treynor ratio of the portfolio, it can be said as outperforming. It provides the excess return per unit of systematic risk only. The higher the ratio is the better.

Under Relative Measures

Relative measures evaluate fund's risk-adjusted returns in reference to benchmark (Sourd, 2007). It provides basically three tools include Jensen's alpha (differential return), Fama's model and M-squared model.

a) Jensen's Alpha

Jensen's alpha is also known as differential return and can be measured by subtracting the expected rate of return of the portfolio, which includes a risk free rate of return and risk premium (excess return) based on per unit risk (beta, i.e. systematic risk) from the actual rate of return of the portfolio. The formula can be expressed as:

$$\alpha = K_p - E_P$$

Where,

α = value of Jensen's alpha

K_P = annual return on portfolio (actual return)

$E_P = \lfloor K_{RF} + (K_m - K_{RF})\beta_p \rfloor$ = (Expected Rate of Return)

K_{RF}= annual risk-free rate

K_m = annual market return

β_p = beta coefficient of portfolio

Decision: If the value of alpha is positive, then it can be said to be an outperforming portfolio. If the value of alpha is negative, then it can be said to be an underperforming portfolio, and if the value of alpha is zero, then it can be said to be performing as expected portfolio. The positive alpha is the better.

b) Fama's Model

This model is popularly known as Fama's Discomposition model. Fama's Decomposition is used to finely breakdown the portfolio performance. The overall performance of a portfolio has measured by Fama's Decomposition i.e. excess return from a portfolio. Alternatively, overall performance will be equivalent to the total of portfolio risk and selectivity (Seddeke & Rahman, 2016). The model can be expressed as:

$$P_3=K_P-(K_{RF}+P_1+P_2)$$

Where,

K_p = annual portfolio return

K_{RF} = annual risk-free rate

P_1 = premium for systematic risk=$(K_m-K_{RF})\beta_P$

P_2 = premium for unsystematic risk=$(K_m-K_{RF})*\left(\frac{\sigma_P}{\sigma_m}-\beta_P\right)$

P_3 = reward for net selectivity (stock selection)

Decision: If the value of reward for net selectivity (P3) is positive, then it can be said as good stock selection. If the value of reward for net selectivity (P3) is negative, then it can be said as poor stock selection, and if the value of reward for net selectivity (P3) is zero, then it can be said as neutral stock selection.

c) M-Squared Model

This measure evaluates the risk-adjusted performance (RAP) of a portfolio in relation to the market benchmark, expressed in percentage terms. It compares the return between adjusted portfolio and market. The model can be expressed as:

$$M^2=K_P^*-K_m$$

Where,

M^2=value of M-Squared

$K_P^*=K_{RF}+(SRP*\sigma_m)$ = (adjusted portfolio return)

K_{RF} = annual risk-free rate

K_m = annual market return

SRP = Sharpe ratio of portfolio= $\frac{(K_p-K_{RF})}{\sigma_p}$

σ_m = annual standard deviation of market

Decision: If the value of M-squared is positive, then it can be said as outperforming. If the value of M-squared is negative, then it can be said as underperforming and if the value of M-squared is zero, then it can be said as performing as expected.

3.3.2 Rank or Comparison Method

The ranking method is the simplest form of MF schemes evaluation. In this method, each scheme as a whole is compared with other and this comparison of scheme goes on until all the scheme have been evaluated and ranked. All schemes are ranked in the order of their importance from the simplest to the hardest or from the highest to the lowest (Chand, 2021).

So, the rank method will be used to check the effectiveness of the portfolio as per calculated measures from highest to lowest and compared with the benchmark.

CHAPERT 4: DATA ANALYSIS AND PRESENTATION

4.1 Status of Observation of Data Collection

Table 4.1: No. of Data Observations in Months

Year	No. of Observations (f)	Percentage (%)
2018	7	19.44%
2019	12	33.33%
2020	12	33.33%
2021	5	13.89%
Total	**36**	**100.00%**

In table 4.1, there are 7, 12, 12 and 5 months of data that were collected in different years: 2018, 2019, 2020 and 2021 respectively. All the selected schemes have 36 months of NAV data that has been collected from different years. The largest months of data have been collected from the years 2019 and 2020, while the second and third or last months of data have been collected from the years 2018 and 2021 respectively.

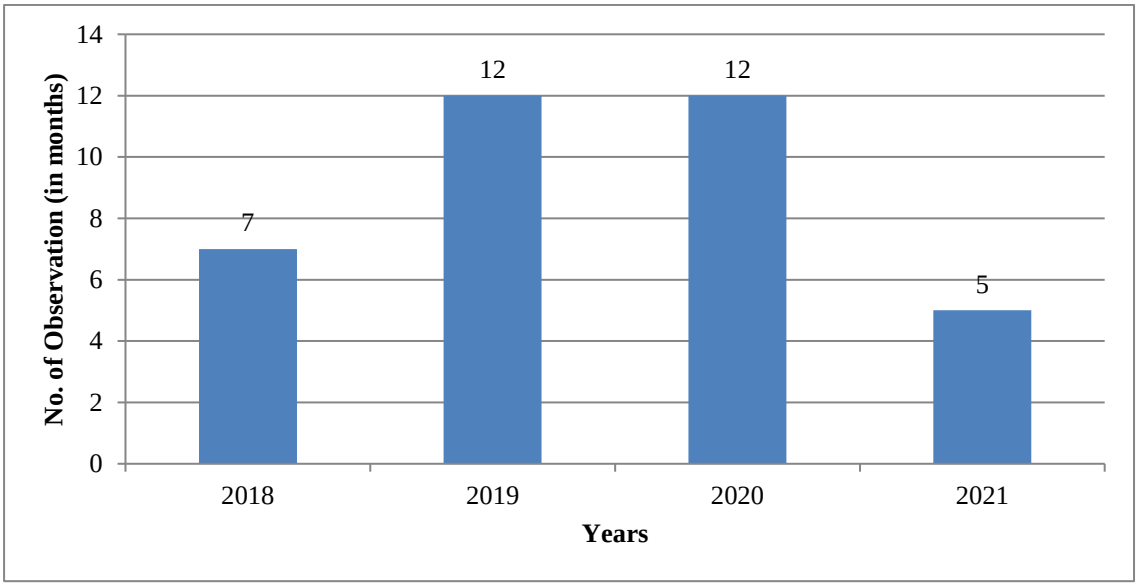

Figure 4.1: No. of Observation Collection in Months

In figure 4.1, there are 7, 12, 12 and 5 months of data that were collected in different years: 2018, 2019, 2020 and 2021 respectively. All the selected schemes have 36 months of NAV data that has been collected from different years. The largest months of data have been collected from the years 2019 and 2020, while the second and third or last months of data have been collected from the years 2018 and 2021 respectively.

4.2 Descriptive Statistics

After selecting and collecting the data of selected samples, the result and findings are as shown below by answering the relevant questions related to this study:

Table 4.2: Holding Period Return

Statistics	NEPSE	SAEF	SEF	NICGF	LEMF
HPR (%)	132.1725	68.6567	42.0652	56.6667	53.0120

In table 4.2, the SAEF has the highest HPR (68.6567%) within the group. But lower than NEPSE HPR (132.1725%). Similarly, the SEF has the lowest HPR (42.0652%) within the group, as well as lower than NEPSE HPR (132.1725%).

Table 4.3: Monthly Performance Status

Statistics	NEPSE	SAEF	SEF	NICGF	LEMF
Average (%)	2.7906	1.7466	1.1214	1.4609	1.4317
Variance (%)	73.7052	49.8162	23.1580	34.9713	43.5169
Standard Deviation (%)	8.5852	7.0581	4.8123	5.9137	6.5967
Covariance	73.7052	30.0490	19.2738	26.9486	21.5501

In table 4.3, the SAEF has the greatest average monthly return (1.7466%) within the group but lower than NEPSE's average monthly return (2.7906%). While, in terms of variance, standard deviation and covariance, SAEF has the highest variance (49.8162%), standard deviation (7.0581%), and covariance (30.0490%) within the group but lower than variance (73.7052%), standard deviation (8.5852%), and covariance (73.7052%) of NEPSE.

Table 4.4: Annual Performance Status

Statistics	NEPSE	SAEF	SEF	NICGF	LEMF
Annualized Return (%)	14.5543	12.5106	11.0177	11.9218	11.7184
Annualized Risk (S.D. %)	24.8822	20.4562	13.9473	17.1394	19.1192
Annual Risk Free Rate (%)	8.7802	8.7802	8.7802	8.7802	8.7802
Beta (Systematic Risk)	1.0000	0.4077	0.2615	0.3656	0.2924

In table 4.4, the SAEF has the greatest annualized return (12.5106%) within the group but lower than NEPSE's annualized return (14.5543%). While, in terms of annualized risk, SAEF has the highest annualized risk (20.4562%) within the group but lower than NEPSE’s annualized risk (24.8822%). Similarly, it terms of beta coefficient, the

SAEF has highest beta coefficient (0.4077) within group but lower than NEPSE's beta (1.000). The annual risk free rate 8.7802 % has assumed as per the value of T-bill determined by Nepal Rastra Bank (see in appendices, 1).

4.3 Portfolio Performance Evaluation Report

After calculating the relevant measures (HPR, monthly- average return, variance, standard deviation, covariance, beta coefficient, and annual risk, return, and risk free rate), related to these tools, the portfolio evaluation report is as shown below:

4.2.1 Sharpe's Ratio Report

Table 4.5: Value of Sharpe's Ratio for Portfolio Evaluation

Schemes/Measures	Sharpe's Ratio	
	Values	Rank
SAEF	0.1824	2
SEF	0.1604	3
NICGF	0.1833	1
LEMF	0.1537	4
NEPSE	0.2321	

In table 4.6, NICGF has the highest (0.1833) Sharpe's value within the group but the lowest (0.2321) on the benchmark (NEPSE). It shows that the NICGF scheme is outperforming (effective portfolio) within the group and close to NEPSE. The second, third, fourth highest schemes are SAEF, SEF and LEMF respectively.

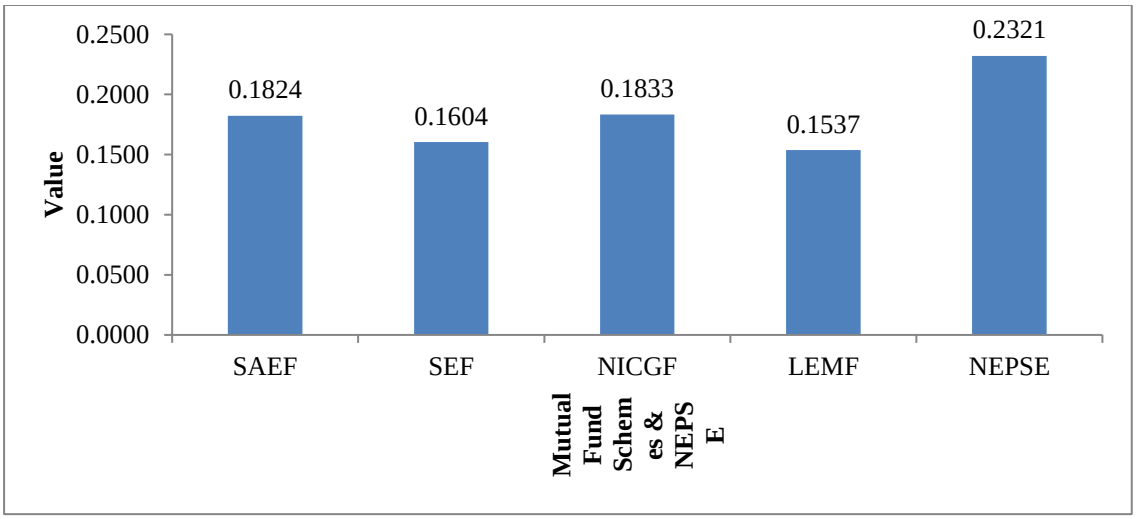

Figure 4.2: Sharpe's Ratio

In figure 4.2, NICGF has the highest (0.1833) Sharpe's value within the group but the lowest (0.2321) on the benchmark (NEPSE). It shows that the NICGF scheme is outperforming (effective portfolio) within the group and close to NEPSE. The second, third, fourth highest schemes are SAEF, SEF and LEMF respectively.

4.2.2 Treynor's Ratio Report

Table 4.6: Value of Treynor's Ratio for Portfolio Evaluation

Schemes/Measures	Treynor's Ratio	
	Values	Rank
SAEF	9.1501	2
SEF	8.5567	4
NICGF	8.5923	3
LEMF	10.0492	1
NEPSE	5.7741	

In table 4.7, LEMF has the highest (10.0492) Treynor's value within the group, as well as from the benchmark (NEPSE). It shows that the LEMF scheme is outperforming (effective portfolio) within the group and from NEPSE. The second, third, fourth highest schemes are SAEF, NICGF, and SEF respectively.

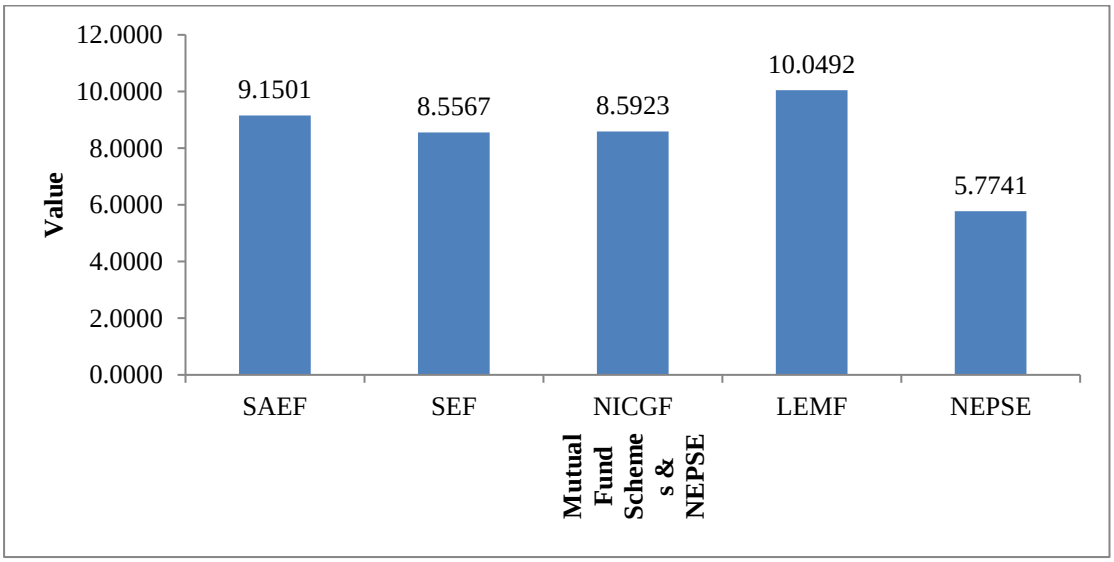

Figure 4.3: Treynor's Ratio

In figure 4.3, LEMF has the highest (10.0492) Treynor's value within the group, as well as from the benchmark (NEPSE). It shows that the LEMF scheme is

outperforming (effective portfolio) within the group and from NEPSE. The second, third, fourth highest schemes are SAEF, NICGF, and SEF respectively.

4.2.3 Jensen's Alpha Report

Table 4.7: Value of Jensen's Alpha for Portfolio Evaluation

Schemes/Measures	Jensen's Alpha	
	Values	Rank
SAEF	1.3763	1
SEF	0.7276	4
NICGF	1.0304	3
LEMF	1.2500	2
NEPSE	0.0000	-

In table 4.8, SAEF has the highest (1.3763) Jensen's value within the group, as well as from the benchmark (NEPSE). It shows that the SAEF scheme is outperforming (effective portfolio) within the group and from NEPSE. The second, third, fourth highest schemes are LEMF, NICGF, and SEF respectively.

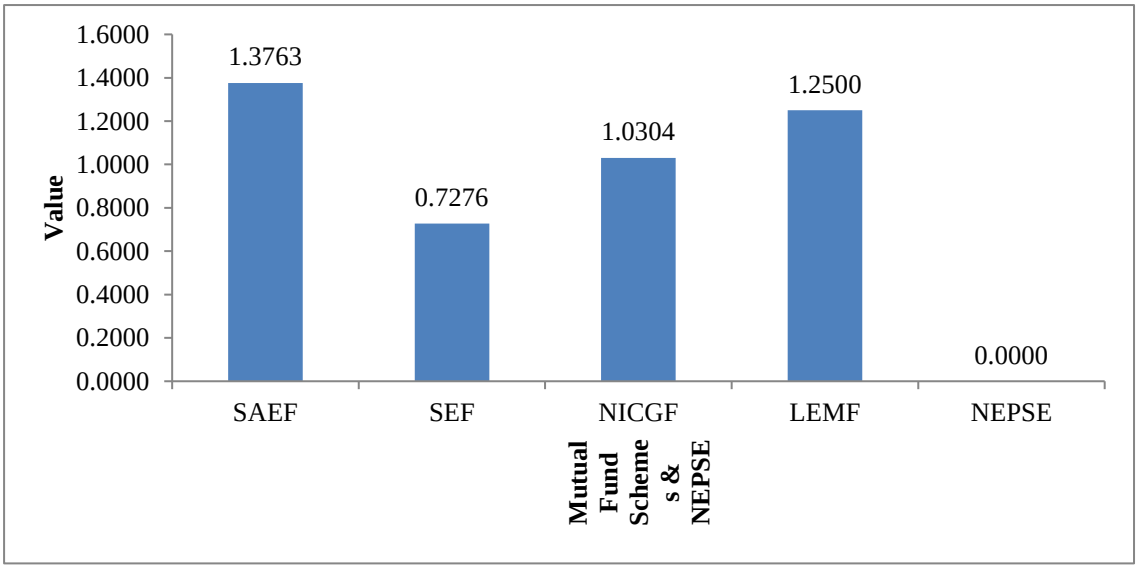

Figure 4.4: Jensen's Alpha

In figure 4.4, SAEF has the highest (1.3763) Jensen value within the group as well as, from the benchmark (NEPSE). It shows that the SAEF scheme is outperforming (effective portfolio) within the group and from NEPSE. The second, third, fourth highest schemes are LEMF, NICGF, and SEF respectively.

4.2.4 Fama's Net Selectivity Report

Table 4.8: Value of Fama's Net Selectivity for Portfolio Evaluation

Schemes/Measures	Fama's Net Selectivity	
	Values	Rank
SAEF	-1.0166	3
SEF	-0.9990	2
NICGF	-0.8358	1
LEMF	-1.4986	4
NEPSE	0.0000	-

In table 4.9, NICGF has the highest (-0.8358) Fama's Net Selectivity value within the group as well as, from the benchmark (NEPSE). It shows that the NICGF scheme is outperforming (effective portfolio) within the group and but underperforming from the NEPSE. The second, third, fourth highest schemes are LEMF, NICGF, and SEF respectively.

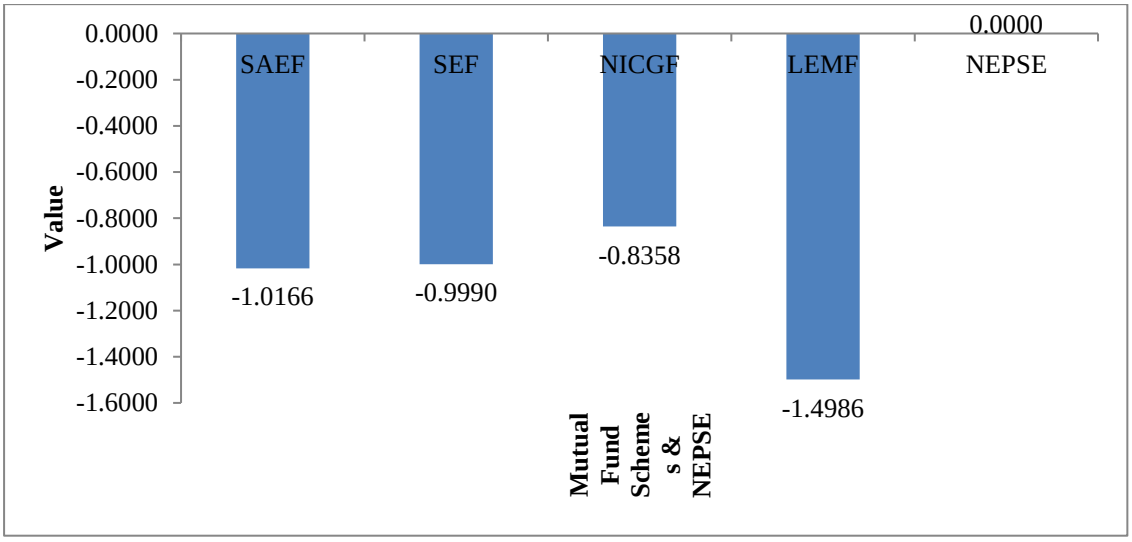

Figure 4.5: Fama's Net Selectivity Ratio

In figure 4.5, NICGF has the highest (-0.8358) Fama's Net Selectivity value within the group, as well as the benchmark (NEPSE). It shows that the NICGF scheme is outperforming (effective portfolio) within the group but underperforming from the NEPSE. The second, third, fourth highest schemes are LEMF, NICGF, and SEF respectively.

4.2.5 M-Squared Report

Table 4.9: Value of M-Squared for Portfolio Evaluation

Schemes/Measures	M-Squared	
	Values	Rank
SAEF	-1.2366	2
SEF	-1.7823	3
NICGF	-1.2133	1
LEMF	-1.9503	4
NEPSE	0.0000	-

In table 4.10, NICGF has the highest (-1.2133) M-Squared value within the group as well as from the benchmark (NEPSE). It shows that the NICGF scheme is outperforming (effective portfolio) within the group but underperforming from the NEPSE. The second, third, fourth highest schemes are SAEF, SEF, and LEMF respectively.

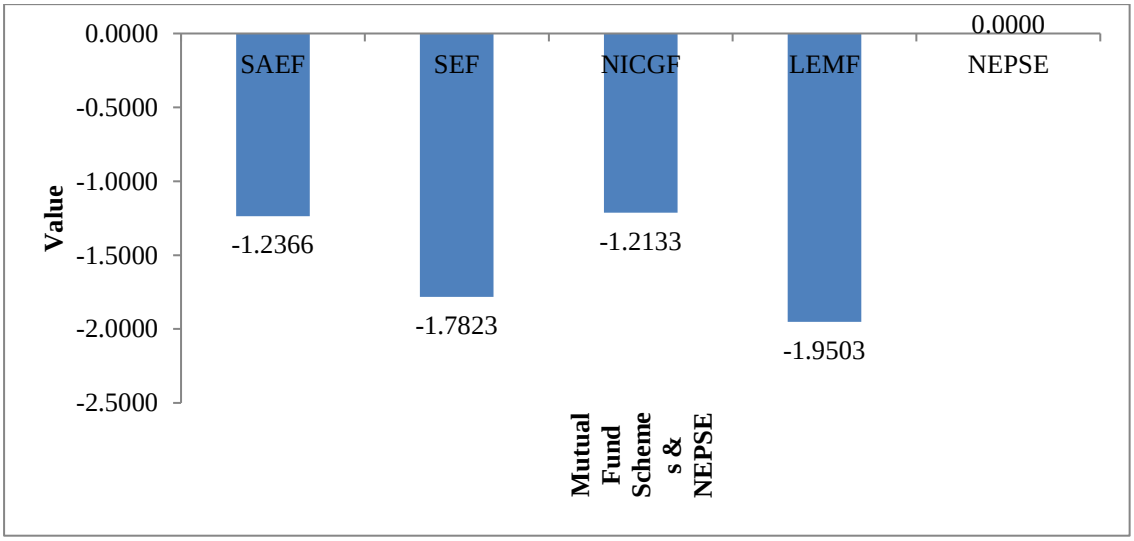

Figure 4.6: M-Squared Ratio

In figure 4.6, NICGF has the highest (-1.2133) M-Squared value within the group as well as from the benchmark (NEPSE). It shows that the NICGF scheme is outperforming (effective portfolio) within the group but underperforming from the NEPSE. The second, third, fourth highest schemes are SAEF, SEF, and LEMF respectively.

4.4 Correlation Analysis between the Variables

4.2.6 Correlation between Annualized Return and Sharpe's Ratio

Table 4.10: Correlation between Annualized Return and Sharpe's Ratio

Schemes	**Annualized Return (%)**	**Sharpe's Ratio**
SAEF	12.5106	0.1824
SEF	11.0177	0.1604
NICGF	11.9218	0.1833
LEMF	11.7184	0.1537
Correlation Value		**0.69**

In table 4.10, there is a positive relationship between the annualized return and Sharpe's value. That means, the higher the annualized return, the higher the Sharpe's ratio. Similarly, the lower the annualized return, the lower the Sharpe's ratio. Hence, it accepts the alternative hypothesis.

4.2.7 Correlation between Annualized Return and Treynor''s Ratio

Table 4.11: Correlation between Annualized Return and Treynor's Ratio

Schemes	**Annualized Return (%)**	**Treynor's Ratio**
SAEF	12.5106	9.1501
SEF	11.0177	8.5567
NICGF	11.9218	8.5923
LEMF	11.7184	10.0492
Correlation Value		**0.25**

In table 4.11, there is a positive relationship between the annualized return and Treynor's value. That means, the higher the annualized return, the higher the Treynor's ratio. Similarly, the lower the annualized return, the lower the Treynor's ratio. Hence, it accepts the alternative hypothesis.

4.2.8 Correlation between Annualized Return and Jensen's Alpha

Table 4.12: Correlation between Annualized Return and Jensen's Alpha

Schemes	Annualized Return (%)	Jensen's Alpha
SAEF	12.5106	1.3763
SEF	11.0177	0.7276
NICGF	11.9218	1.0304
LEMF	11.7184	1.2500
Correlation Value		**0.89**

In table 4.12, there is a positive relationship between the annualized return and Jensen's Alpha. That means, the higher the annualized return, the higher Jensen's Alpha. Similarly, the lower the annualized return, the lower Jensen's Alpha. Hence, it accepts the alternative hypothesis.

4.2.9 Correlation between Annualized Return and Fama's Value

Table 4.13: Correlation between Annualized Return and Fama's Value

Schemes	Annualized Return (%)	Fama's Value
SAEF	12.5106	-1.0166
SEF	11.0177	-0.9990
NICGF	11.9218	-0.8358
LEMF	11.7184	-1.4986
Correlation Value		**0.09**

In table 4.13, there is a positive relationship between the annualized return and Fama's value. That means, the higher the annualized return, the higher the Fama's value. Similarly, the lower the annualized return, the lower the Fama's value. Hence, it accepts the alternative hypothesis.

4.2.10 Correlation between Annualized Return and M-Squared Value

Table 4.14: Correlation between Annualized Return and M-Squared Value

Schemes	Annualized Return (%)	M-Squared Value
SAEF	12.5106	-1.2366
SEF	11.0177	-1.7823
NICGF	11.9218	-1.2133
LEMF	11.7184	-1.9503
Correlation Value		**0.69**

In table 4.14, there is a positive relationship between the annualized return and the M-Squared value. That means, the higher the annualized return, the higher the M-Squared value. Similarly, the lower the annualized return, the lower the M-Squared value. Hence, it accepts the alternative hypothesis.

4.2.11 Correlation between Annualized Risk and Sharpe's Ratio

Table 4.15: Correlation between Annualized Risk and Sharpe's Ratio

Schemes	**Annualized Risk (%)**	**Sharpe's Ratio**
SAEF	20.4562	0.1824
SEF	13.9473	0.1604
NICGF	17.1394	0.1833
LEMF	19.1192	0.1537
Correlation Value		**0.31**

In table 4.10, there is a positive relationship between the annualized risk and Sharpe's value. That means, the higher the annualized risk, the higher the Sharpe's ratio. Similarly, the lower the annualized risk, the lower the Sharpe's ratio. Hence, it accepts the alternative hypothesis.

4.2.12 Correlation between Annualized Risk and Treynor''s Ratio

Table 4.16: Correlation between Annualized Risk and Treynor's Ratio

Schemes	**Annualized Risk (%)**	**Treynor's Ratio**
SAEF	20.4562	9.1501
SEF	13.9473	8.5567
NICGF	17.1394	8.5923
LEMF	19.1192	10.0492
Correlation Value		**0.64**

In table 4.11, there is a positive relationship between the annualized risk and Treynor's value. That means, the higher the annualized risk, the higher the Treynor's ratio. Similarly, the lower the annualized risk, the lower the Treynor's ratio. Hence, it accepts the alternative hypothesis.

4.2.13 Correlation between Annualized Risk and Jensen's Alpha

Table 4.17: Correlation between Annualized Risk and Jensen's Alpha

Schemes	Annualized Risk (%)	Jensen's Alpha
SAEF	20.4562	1.3763
SEF	13.9473	0.7276
NICGF	17.1394	1.0304
LEMF	19.1192	1.2500
Correlation Value		**1.00**

In table 4.12, there is a positive relationship between the annualized risk and Jensen's Alpha. That means, the higher the annualized risk, the higher Jensen's Alpha. Similarly, the lower the annualized risk, the lower Jensen's Alpha. Hence, it accepts the alternative hypothesis.

4.2.14 Correlation between Annualized Risk and Fama's Value

Table 4.18: Correlation between Annualized Risk and Fama's Value

Schemes	Annualized Risk (%)	Fama's Value
SAEF	20.4562	-1.0166
SEF	13.9473	-0.9990
NICGF	17.1394	-0.8358
LEMF	19.1192	-1.4986
Correlation Value		**(0.35)**

In table 4.13, there is a negative relationship between the annualized risk and Fama's value. That means, the higher the annualized risk, the lower the Fama's value. Similarly, the lower the annualized risk, the higher the Fama's value. Hence, it rejects the alternative hypothesis.

4.2.15 Correlation between Annualized Risk and M-Squared Value

Table 4.19: Correlation between Annualized Risk ad M-Squared Value

Schemes	Annualized Risk (%)	M-Squared Value
SAEF	20.4562	-1.2366
SEF	13.9473	-1.7823
NICGF	17.1394	-1.2133
LEMF	19.1192	-1.9503
Correlation Value		**0.31**

In table 4.14, there is a positive relationship between the annualized risk and the M-Squared value. That means, the higher the annualized risk, the higher the M-Squared value. Similarly, the lower the annualized risk, the lower the M-Squared value. Hence, it accepts the alternative hypothesis.

4.2.16 Correlation between Beta Coefficient and Sharpe's Ratio

Table 4.20: Correlation between Beta Coefficient and Sharpe's Ratio

Schemes	Beta Coefficient	Sharpe's Ratio
SAEF	0.4077	0.1824
SEF	0.2615	0.1604
NICGF	0.3656	0.1833
LEMF	0.2924	0.1537
Correlation Value		**0.89**

In table 4.15, there is a positive relationship between the beta coefficient and Sharpe's value. That means, the higher the beta coefficient, the higher the Sharpe's ratio. Similarly, the lower the beta coefficient, the lower the Sharpe's ratio. Hence, it accepts the alternative hypothesis.

4.2.17 Correlation between Beta Coefficient and Treynor's Ratio

Table 4.21: Correlation between Beta Coefficient and Treynor's Ratio

Schemes	Beta Coefficient	Treynor's Ratio
SAEF	0.4077	9.1501
SEF	0.2615	8.5567
NICGF	0.3656	8.5923
LEMF	0.2924	10.0492
Correlation Value		**(0.09)**

In table 4.16, there is a negative relationship between the beta coefficient and Treynor's ratio. That means, the higher the beta coefficient, the lower the Treynor's ratio. Similarly, the lower the beta coefficient, the higher the Treynor's ratio. Hence, it rejects the alternative hypothesis.

4.2.18 Correlation between Beta Coefficient and Jensen's Alpha

Table 4.22: Correlation between Beta Coefficient and Jensen's Alpha

Schemes	Beta Coefficient	Jensen's Alpha
SAEF	0.4077	1.3763
SEF	0.2615	0.7276
NICGF	0.3656	1.0304
LEMF	0.2924	1.2500
Correlation Value		**0.68**

In table 4.17, there is a positive relationship between the beta coefficient and Jensen's Alpha. That means, the higher the beta coefficient, the higher Jensen's Alpha. Similarly, the lower the beta coefficient, the lower Jensen's Alpha. Hence, it accepts the alternative hypothesis.

4.2.19 Correlation between Beta Coefficient and Fama's Value

Table 4.23: Correlation between Beta Coefficient and Fama's Value

Schemes	Beta Coefficient	Fama's Value
SAEF	0.4077	-1.0166
SEF	0.2615	-0.9990
NICGF	0.3656	-0.8358
LEMF	0.2924	-1.4986
Correlation Value		**0.42**

In table 4.18, there is a positive relationship between the beta coefficient and Fama's value. That means, the higher the beta coefficient, the higher the Fama's value. Similarly, the lower the beta coefficient, the lower the Fama's value. Hence, it accepts the alternative hypothesis.

4.2.20 Correlation between Beta Coefficient and M-Squared Value

Table 4.24: Correlation between Beta Coefficient and M-Squared Value

Schemes	Beta Coefficient	M-Squared Value
SAEF	0.4077	-1.2366
SEF	0.2615	-1.7823
NICGF	0.3656	-1.2133
LEMF	0.2924	-1.9503
Correlation Value		**0.89**

In table 4.19, there is a positive relationship between the beta coefficient and the M-Squared value. That means, the higher the beta coefficient, the higher the M-Squared value. Similarly, the lower the beta coefficient, the lower the M-Squared value. Hence, it accepts the alternative hypothesis.

4.5 Performance Comparison Analysis Based on Variables

Table 4.25: Performance Comparison Based on Annualized Return

Schemes	**Sharpe's Value**	**Treynor's Value**	**Jensen's Alpha Value**	**Fama's Value**	**M-Squared Value**
SAEF	0.1824	9.1501	1.3763	-1.0166	-1.2366
SEF	0.1604	8.5567	0.7276	-0.9990	-1.7823
NICGF	0.1833	8.5923	1.0304	-0.8358	-1.2133
LEMF	0.1537	10.0492	1.2500	-1.4986	-1.9503
NEPSE	0.2321	5.7741	0.0000	0.0000	0.0000
Correl.	**0.69**	**0.25**	**0.89**	**0.09**	**0.69**
	NICGF	LEMF	SAEF	NICGF	NICGF
Within Group	O	O	O	O	O
Benchmark	U	O	O	U	U

In table 4.25, the NICGF is outperforming within the group but underperforming than benchmark (NEPSE) in terms of Sharpe's ratio, Fama's value and M-Squared value. The LEMF and SAEF are outperforming within the group as well as on the benchmark in terms of Treynor's ratio and Jensen's Alpha. There is a positive relationship between annualized return and all the portfolio evaluation tools.

Table 4.26: Performance Comparison Based on Annualized Risk

Schemes	**Sharpe's Value**	**Treynor's Value**	**Jensen's Alpha Value**	**Fama's Value**	**M-Squared Value**
SAEF	0.1824	9.1501	1.3763	-1.0166	-1.2366
SEF	0.1604	8.5567	0.7276	-0.9990	-1.7823
NICGF	0.1833	8.5923	1.0304	-0.8358	-1.2133
LEMF	0.1537	10.0492	1.2500	-1.4986	-1.9503
NEPSE	0.2321	5.7741	0.0000	0.0000	0.0000
Correl.	**0.31**	**0.64**	**1.00**	**(0.35)**	**0.31**
	NICGF	LEMF	SAEF	LEMF	NICGF
Within Group	O	O	O	O	O
Benchmark	U	O	O	O	U

In table 4.26, the NICGF is outperforming within the group but underperforming than benchmark (NEPSE) in terms of Sharpe's ratio and M-Squared value. The LEMF is outperforming within the group as well as on the benchmark in terms of Treynor's ratio and Fama's value. Similarly, the SAEF is outperforming within the group as well as on the benchmark. There is a positive relationship between annualized return and all the portfolio evaluation tools except Fama's model.

Table 4.27: Performance Comparison Based on Beta Coefficient

Schemes	**Sharpe's Value**	**Treynor's Value**	**Jensen's Alpha Value**	**Fama's Value**	**M-Squared Value**
SAEF	0.1824	9.1501	1.3763	-1.0166	-1.2366
SEF	0.1604	8.5567	0.7276	-0.9990	-1.7823
NICGF	0.1833	8.5923	1.0304	-0.8358	-1.2133
LEMF	0.1537	10.0492	1.2500	-1.4986	-1.9503
NEPSE	0.2321	5.7741	0.0000	0.0000	0.0000
Correl.	**0.89**	**(0.09)**	**0.68**	**0.42**	**0.89**
	NICGF	SEF	SAEF	NICGF	NICGF
Within Group	O	O	O	O	O
Benchmark	U	U	O	O	U

In table 4.27, the NICGF is outperforming within the group but underperforming than benchmark (NEPSE) in terms of Sharpe's ratio and M-Squared value. While, in terms of Fama's value, NICGF and SAEF are outperforming within the group as well as on the benchmark. Similarly, the SEF is outperforming within the group but underperforming than benchmark. There is a positive relationship between annualized return and all the portfolio evaluation tools except Treynor's ratio.

4.6 Discussion

The data suggests that the SAEF obtained the highest value in terms of HPR, monthly average return, beta coefficient, and annualized return and risk respectively. But based on the Sharpe's value, Fama's value, and M-squared values, the NICGF was the highest performance value within the group but the lowest from benchmark as per Sharpe's ratio only. Similarly, based on Treynor's ratio and Jensen's ratio, the LEMF and SAEF were the highest performance values within the group as well as on the benchmark (NEPSE).

According to the annualized return factor, the result demonstrates that there is a positive relationship between the annualized return and the value of Sharpe's ratio, Treynor's ratio, Jensen's alpha, Fama's value and M-Squared value. The NICGF, LEMF and SAEF mutual funds have positive relationship between annualized return and all the portfolio evaluation tools. However, NICGF is underperforming on the benchmark but outperforming within group based on Sharpe's ratio, Fama's value, and M-Squared value. The LEMF and SAEF are outperforming within the group as well as on the benchmark based on Treynor's ratio and Jensen's Alpha respectively.

According to the annualized risk factor, the result demonstrates that there is a positive relationship between the annualized risk and the value of Sharpe's ratio, Treynor's ratio, Jensen's alpha and M-Squared value. The NICGF, LEMF and SAEF mutual funds have positive relationship between annualized risk and Sharpe's ratio, Treynor's ratio, Jensen's alpha and M-Squared value. The LEMF has negative relationship between annualized risk and Fama's value. However, NICGF is underperforming on the benchmark but outperforming within group based on Sharpe's ratio and M-Squared value. The LEMF is outperforming within the group as well as on the benchmark based on Treynor's ratio and Fama's value. But based on Jensen's Alpha, the SAEF is outperforming within the group as well as on the benchmark.

According to the beta coefficient factor, the result demonstrates that there is a positive relationship between the beta coefficient and the value of Sharpe's ratio, Jensen's Alpha, Fama's Value and M-Squared Value. While a negative relationship between the beta coefficient and Treynor's ratio. The NICGF and SAEF mutual funds have positive relationship between the beta coefficient and Sharpe's ratio, Jensen's Alpha, Fama's value and M-Squared value. The SEF has negative relationship between the beta coefficient and Treynor's ratio. However, NICGF is underperforming on the benchmark but outperforming within group based on Sharpe's ratio as well as M-Squared value. The SEF is outperforming within the group but underperforming than benchmark. While, SAEF is outperforming with the group as well as on the benchmark.

However, based on the findings of similar studies, a more plausible explanation is that the factors include diversification, liquidity, return, assets and efficiency of fund

managers, which affect the performance of portfolios. The previous research shows mutual funds overperformed than benchmark with a low amount of diversification.

These results should be taken into account when considering how to select the fund to ensure whether the fund is outperforming or not on the benchmark as well as within the group for various investment goals.

CHAPERT 5: FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Major Findings

This study was conducted for the purpose of evaluating the overall performance of equity mutual funds in Nepal to ensure the effectiveness (outperforming) of the portfolio. All the equity mutual funds are closed-ended funds in nature. The quantitative research methodology was used to deal with numbers and its measures. A descriptive research design was utilized to interpret the result of facts and figures in certain situations and a secondary data collection method was used for gathering the data that included the website (sharesansar.com) which served as the instrument for collecting data. There are four numbers of equity mutual fund schemes that were selected as a sample size using an arbitrary approach with the help of a stratified sampling method. The data was collected during the equity mutual fund performance years 2018-2021. So based on the above research process and tools, the following are the major findings of the study that were analyzed based on the research questions listed below:

i. The SAEF had the highest HPR (68.6567 percent) within the group.
ii. The SAEF had the greatest monthly average return (1.7466 percent) within the group.
iii. The SAEF had the highest (0.4077) beta coefficient or value of systematic risk within the group.
iv. The SAEF had the highest annual risk (20.4562 percent) and return (12.5106 percent) within the group.
v. The NICGF had the highest (0.1833) Sharpe's value within the group, but the lowest than the benchmark (NEPSE).
vi. The LEMF had the highest (10.0492) Treynor's value within the group as well as on the benchmark (NEPSE).
vii. The SAEF had the highest (1.3763) Jensen's value within the group as well as on the benchmark (NEPSE).
viii. The NICGF had the highest (-0.8358) Fama's Net Selectivity value within the group but underperforming from the benchmark (NEPSE).

ix. The NICGF had the highest (-1.2133) M-Squared value within the group but underperforming from the benchmark (NEPSE).

x. There is a positive relationship between the annualized return and the value of Sharpe's ratio, Treynor's ratio, Jensen's alpha, Fama's value and M-Squared value.

xi. There is a positive relationship between the annualized risk and Sharpe's ratio, Treynor's ratio, Jensen's alpha and M-Squared value.

xii. There is a negative relationship between the annualized risk and Fama's value

xiii. There is a positive relationship between the beta coefficient and Sharpe's ratio, Jensen's alpha, Fama's value and M-Squared value.

xiv. There is a negative relationship between the beta coefficient and Treynor's ratio

5.2 Conclusion

The performance evaluation tools of a portfolio have its own parameters or factors and thus its results are different. After measuring the performance of all the selected mutual funds, researcher found different values based on different tools of portfolio evaluation. So, according to Sharpe's ratio, the NICGF has the highest performance value because the average standard deviation of all the schemes is nearly equal to the standard deviation of NICGF. Similarly, according to Treyner ratio, the LEMF has the highest performance value because the average beta coefficient of all the schemes is nearly equal to beta coefficient of LEMF. While according to Jensen's Alpha, the SAEF has the highest value because the beta coefficient affect the value of Jensen's alpha, Similarly, according to Fama's Value and M-Squared value, the NICGF has highest value because the annualized standard deviation and beta coefficient affect the Fama's value and annualized standard deviation and Sharpe's ratio affect the value of M-Squared.

As per the relationship between annualized return and portfolio evaluation measures, the NICGF is outperforming within a group but underperforming than benchmark based on Sharpe's ratio. Similarly, the LEMF is outperforming within a group as well as on the benchmark based on Treynor's ratio. While SAEF is outperforming within a group as well as on the benchmark based on Jensen's Alpha and Fama's value. Similarly, as per the relationship between annualized risk and portfolio evaluation

measures, again the NICGF is outperforming within the group but underperforming than benchmark based on Sharpe's ratio and M-Squared value. The LEMF is outperforming within the group as well as on the benchmark based on Treynor's ratio and Fama's value. But based on Jensen's Alpha, the SAEF is outperforming within the group as well as on the benchmark. While, as per the relationship between the beta coefficient and portfolio evaluation measures, NICGF is underperforming on the benchmark but outperforming within group based on Sharpe's ratio and M-Squared value. The SEF is outperforming within the group but underperforming than benchmark. While, SAEF is outperforming with the group as well as on the benchmark.

According to annualized return, annualized risk and the beta coefficient factors, the SAEF shows the highest performance value based on Jensen's Alpha because, it is outperforming within as well as on the benchmark. There is no any correlation between Sharpe's ratio and M-Squared value because, it provides the same correlation coefficient value across all above three factors.

5.3 Recommendation

Due to lack of data on the performance evaluation of equity mutual funds in Nepal, the result cannot confirm the results of the current performance of the mutual fund. So, it is recommended that similar research should be conducted in various ways, such as use of different places, increasing the size of samples, use of different schemes, increasing the period of data collection, use of different portfolio evaluation tools etc. These factors could affect the performance of the mutual fund scheme.

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Appendices

1. List of Supportive Formulas for Tools and Model Formulas

i. Annualized Market Return (K_m)= $\left[\left[(1+HPR_m)^{\frac{1}{n}}\right]-1\right]*100$

Where n = total no. of months

ii. Annualized Portfolio Return (K_p)= $\left[\left[(1+HPR_p)^{\frac{1}{n}}\right]-1\right]*100$

iii. Holding Period Return of Market (HPR_m)= $\frac{\text{EM NAV of Market -BM NAV of Market}}{\text{BM NAV of Market}}*100$

iv. Holding Period Return of Portfolio (HPR_p)= $\frac{\text{EM NAV of Portfolio -BM NAV of Portfolio}}{\text{BM NAV of Portfolio}}*100$

v. Annualized Market Risk (σ_m)= $\sigma_m * \sqrt{8.4}$

where 8.4 is total no. of months converted from 252 days. The total trading days is 252 days year in after deducting the total no. of business off days and annual holidays from 365 days.

vi. Annualized Portfolio Risk (σ_p)= $\sigma_p * \sqrt{8.4}$

vii. Sample Portfolio Mean Return ($\bar{P}$)=$\frac{\sum P}{n}$ where, P = Particular Portfolio or Mutual Fund Scheme

viii. Sample Market Mean Return ($\bar{M}$)=$\frac{\sum M}{n}$ where, M = Market or Benchmark Index (NEPSE)

ix. Sample Portfolio Variance $\left(S\sigma_p{}^2\right)$=$\frac{\sum(P-\bar{P})^2}{n-1}$

x. Sample Market Variance ($S\sigma_m{}^2$)=$\frac{\sum(M-\bar{M})^2}{n-1}$

xi. Sample Standard Deviation of Portfolio ($S\sigma_p$)=$\sqrt{S\sigma_p{}^2}$

xii. Sample Standard Deviation of Market ($S\sigma_m$)=$\sqrt{S\sigma_m{}^2}$

xiii. Annualized Risk Free Rate (K_{RF})= $\frac{\sum(\text{Total Monthly Treasury Bill Rate})}{\text{No. of Monthly Treasury Bill Rates Available in a year}}$

xiv. Beta Coefficient of Portfolio $\left(\beta_p\right)$= $\frac{COV(K_p,K_m)}{\sigma_m{}^2}$

xv. Beta Coefficient of Market $\left(\beta_m\right)$= 1 . Since, beta of the market is always 1.

xvi.Sample Covariance of Portfolio=COV $(K_p,K_m)=\frac{\sum(P-\bar{P})(M-\bar{M})}{n-1}$

2. 364 days Weight Average Treasury Bills Rate (WATBR)

	Sum of Monthly WATBR												AA WATBR
Y/M	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
2017	2.85		7.94	4.67		2.10		4.04	5.71	5.74	8.72	11.89	**5.96**
2018	5.38		10.25	10.89	10.44	9.35		11.61	9.92	6.12	5.06		**8.78**
2019	3.08											14.73	**8.91**
2020					19.22	7.81	2.26	1.47	3.42	7.35	4.04	5.41	**6.37**
2021		1.98	3.00	3.40									**2.79**

Source: (Nepal Rastra Bank, 2017)