

University of Bahrain
College of Business Administration
Department of Business and Management
MBA Program



THE QUARTERLY MUTUAL FUND RETURNS AND THE PERFORMANCE EVALUATION TECHNIQUES

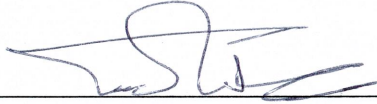
Project submitted in partial fulfillment of
The requirements for Master Degree in
Business Administration (MBA)

By: SAWSAN ABULHASSAN MOH'D

March, 1999

DECLARATION

I declare that this work is the result of my own investigation and that it has not already been accepted in substance for any degree, nor is it being currently submitted for any degree.

Signed:  Date: March, 99
Sawsan Abulhassan Moh'd (Candidate)

The Thesis defense committee considers the Thesis titled:

“THE QUARTERLY MUTUAL FUND RETURNS AND THE PERFORMANCE EVALUATION TECHNIQUES”

submitted by Sawsan Abulhassan Moh'd to the department of Business Administration and accepted for the Master of Business Administration in Management.

Thesis Defense Committee:



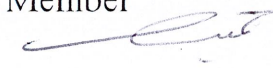
Dr. Jassim Abdulla
Supervisor

Department of Business Administration



Dr. Hameeda Jassim
Member

Department of Business Administration



Dr. ~~Nazem~~ Al-Saleh
Member

Department of Business Administration

ACKNOWLEDGMENT

ACKNOWLEDGMENT

I would like to express my thanks to my parents for their continuous efforts in supporting me throughout my career and especially my father whom have been of great support.

My sincere appreciation and gratitude to my supervisor Dr Jassim Abdullah for his kind assistance and guidance throughout the development of this thesis. With my best thanks to Dr. Hameeda Jassim and Dr. Nazem Al-Saleh for being the readers of this project.

Finally, would like to extend my thanks to my husband Jaffer for his continuous help and advise.

ABSTRACT

ABSTRACT

Most investment professionals agree that it's smarter to own a variety of stocks and bonds than to gamble on the success of a few. But diversifying can be tough because buying a portfolio of individual stocks and bonds may be expensive. And knowing what to buy-and when-can be a full-time job.

Mutual funds, also known as a unit trust that offers one solution; when investors put money into a fund, it's pooled with money from other investors to create greater buying power than they would have been investing individually.

Since a fund can own hundreds of different securities, its success doesn't dependent on how one or two holdings do. And the fund's managers keep constant tabs on the markets, adjusting the portfolio to reflect changing conditions.

A mutual fund has two distinct yet intertwined businesses: making a profit and providing services to its clients. Each fund, or closely related group of funds, is run by a professional manager responsible for both its day-to-day operations and for its successful performance. In fact, the skill of the manager is so closely linked to the success of a fund that many experts advise investors to pick a fund based on the manager-and even to drop a fund if a star manager leaves.

The most important investment result is the periodic performance evaluation of the fund. Having different evaluation techniques and different benchmarks, the selection of the technique and the benchmark may end with different results.

In the performance evaluation of the fund, a number of aspects are considered; i.e., the evaluation techniques together with the benchmark used. Different techniques may result to different evaluation results beside different benchmarks may result to different results. To validate the results found by Grinblatt and Titman (1994) that techniques of similar inferences result to same results if the same benchmark is used. However, techniques of similar inferences may vary when using different benchmarks.

This paper empirically contrasts the Sharpe Measure and the Treynor Measure on a sample of four Mutual Funds using a variety of benchmark portfolios.

The study finds that the measures generally of similar inferences when using the same benchmark and that the inferences can vary, even with the same measure, when using different benchmarks.

TABLE OF CONTENTS

TABLE OF CONTENTS

Chapter One	5
1.1.Introduction	5
1.2. Purpose of the Study.....	5
1.3. Research Problem.....	6
1.4. Scope of the Research.....	6
1.5 Research Data.....	7
1.5.1 Primary Data.....	7
1.5.2 Secondary Data	7
1.6 Methodology	8
1.7 Research Limitations	8
1.8 Organization of the Research.....	9
Chapter Two: Literature Review	10
2.1 Introduction	10
2.1.1 Benchmark Efficiency.....	11
2.1.2 Evaluation Techniques	13
2.1.2.1 Sharpe Performance Index	13
2.1.2.2 Treynor's Performance Index	14
2.2 Summary	15
Chapter Three: Methodology	16
3.1 Introduction	16
3.2 Funds Under Test.....	16
3.2.1 Global Bond Fund (A)	17
3.2.2 Global Bond Fund (B).....	20
3.2.3 Equity Fund (A)	23
3.2.4 Equity Fund (B).....	26
3.3 Selection of Test Time Period.....	29

3.4 Selection of Benchmark	29
3.5 Models Used For Performance Evaluation	30
3.5.1 Sharpe Performance Index	30
3.5.2 Treynor's Slope	31
3.6 Fund Monitor	31
3.7 Summary	32
Chapter Four: Analysis of the Research Findings	33
4.1 Introduction	33
4.1.1 Global Bond Fund (A)	34
4.1.2 Global Bond Fund (B)	35
4.1.3 Global Equity Fund (A)	37
4.1.3.1 Global Equity Fund (A) Using Msci European Index	37
4.1.3.2 Global Equity Fund (A) Using Msci World Index	38
4.1.4 Global Equity Fund (B)	40
4.1.4.1 Global Equity Fund (B) Using Msci Emerging Market Index ..	40
4.1.4.2 Global Equity Fund (B) Using Msci World Index	41
4.5 Summary Results of the Four Funds in Comparison	42
Chapter Five: Conclusions and Summaries	44
Glossary	46
References	49
Appendices	51

LIST OF TABLES & GRAPHS

LIST OF TABLES & GRAPHS

Table #	Title
1	Portfolio Composition by Industry for Global Bond Fund (A)..... 18
2	Portfolio Composition by Country for Global Bond Fund (A) 19
3	Portfolio Composition by Securities for Global Bond Fund (B) ... 21
4	Portfolio Composition by Currency for Global Bond Fund (B) 22
5	Portfolio Composition by Country for Global Equity Fund (A) 24
6	Portfolio Composition by Industry for Global Equity Fund (A) 25
7	Portfolio Composition by Country for Global Equity Fund (B) 27
8	Portfolio Composition by Industry for Global Equity Fund (B) ... 28
9	Summary Results for Global Bond Fund (A) 34
10	Summary Results for Global Bond Fund (B) 35
11	Summary Results for Global Equity Fund (A) 37
12	Summary Results for Global Equity Fund (A) 38
13	Summary Results for Global Equity Fund (B) 40
14	Summary Results for Global Equity Fund (B) 41
15	Summary Results of Four Funds in comparison 42

Graph # Title

1	Portfolio Composition by Industry for Global Bond Fund (A) 18
2	Portfolio Composition by Country for Global Bond Fund (A) 19
3	Portfolio Composition by Securities for Global Bond Fund (B) ... 21
4	Portfolio Composition by Currency for Global Bond Fund (B) 22
5	Portfolio Composition by Country for Global Equity Fund (A) 24
6	Portfolio Composition by Industry for Global Equity Fund (A) ... 25
7	Portfolio Composition by Country for Global Equity Fund (B) 27
8	Portfolio Composition by Industry for Global Equity Fund (B) ... 28

CHAPTER ONE

INTRODUCTION

CHAPTER ONE

1.1.INTRODUCTION

A number of empirical studies have been conducted to assess the effect of the performance evaluation techniques, the benchmark selection, and the attributes of mutual fund on the final result on the performance.

Grinblatt and Titman (1994) have conducted One of studies where they have evaluated the effects of:

- The Performance measure,
- The benchmark selection, and
- The determinants of the mutual funds characteristics

on the performance evaluation results.

Being the head of mutual fund sales in the bank that I am working with, I felt that conducting such study on a number of funds that are being distributed overseas prior to the launch in Bahrain is an essential step for the benefit of the sales team and myself.

This study contains two contributions to the literature on portfolio performance evaluation. First, it examines the sensitivity of performance inferences to benchmark choice. Second, it compares the Sharpe Measure with the Treynor Measure.

1.2. PURPOSE OF THE STUDY

Selecting an objective that best meets an individual's personal financial needs is difficult. There are often many confusing alternatives. Generally

speaking, portfolios are managed for income, capital appreciation, or safety, or some combination thereof.

Considering the large number of Mutual funds that are being traded globally, it worth conducting an empirical study to evaluate the mutual fund returns and the performance evaluation techniques. Moreover, analyze the determinants of mutual fund performance.

1.3. RESEARCH PROBLEM

In evaluating the performance of the mutual funds, there are a number of techniques that are used for the evaluation. The measures are generally similar inferences when using the same benchmark, and that inferences can vary, even with the same measure, when using different benchmarks.

1.4. SCOPE OF THE RESEARCH

In this research, I will be concentrating on a number of Global funds under different types and classifications. The performances of such mutual funds will be evaluated using two different techniques; i.e., Sharpe and Treynor.

Simultaneously, each fund will be evaluated against two different benchmarks; i.e., MSCI World Index, MSCI Equity Index and MSCI Emerging market Index to examine how performance results are effected with different measures and different benchmarks.

Four funds are selected based on the two different types of the Mutual

Funds which are:

1. Global Bond Fund
2. Global Equity Fund.

The four vary in terms of asset allocation composition and risk levels. Money Market funds has not been included in the test as the fund is not considered volatile in terms of asset allocation and risk.

The reasons behind choosing those specific funds are:

- To have different types of funds, e.g. Bond fund, Equity fund and region fund. Therefore, there will not be one specific fund for which the performance evaluation will bias to that one fund.
- Have funds with different asset allocation, whether geographical or industrial for which the suitable benchmarks (Global) can be used for performance evaluation.

1.5 RESEARCH DATA

The research relies on Primary Data and Secondary Data in building the test.

1.5.1 PRIMARY DATA

Four Global Funds have been selected to examine the test which are Two Bond Funds and two Equity Funds.

The data was extracted from the Mutual Funds international trading beside the indices in the specific markets.

1.5.2 SECONDARY DATA

To review the related literature and to ensure that the important facts are taken into account, these sources are considered as:

- Wall Street publications.

- Financial and Business periodicals.
- Internet searching in World Wide Web sites.
- Books related to the subject.

1.6 METHODOLOGY

An empirical study is performed. The following steps were followed:

- Selected a number of funds with different types and different asset allocation, i.e. Bond, Equity and Region with different asset allocations.
- Selected the time period over which the test will be performed.
- Selected the benchmark to evaluate the performance of the funds.
- Selected the techniques to measure the performance of the funds against the benchmarks.

1.7 RESEARCH LIMITATIONS

Since this research is using a limited number of international funds, the following are the main limitations of the research:

1. The result of the research can not be generalized to all the other types of funds unless they are similar to the selected sample in this research.
2. The result of this research can not be compared with others unless the same methodology is applied.
3. The difficulty in obtaining all the data required for the specific funds selected, as those are international funds.

4. Due to the confidentiality of the data obtained as those are for the internal use of the fund managers; in this research the funds examined do not state the institutions using originated them.

1.8 ORGANIZATION OF THE RESEARCH

This research consists of five chapters, the first one has covered the introduction part to define the topic and state the problem. In addition, brief overview of methodology has been given. The remaining chapters are as follow:

Chapter Two - Literature Review: This chapter demonstrates the related literature concerning the Mutual funds, the determinants of mutual funds performance, the techniques used to measure the performance and the effect of the benchmarks.

Chapter Three - Methodology: This chapter explains fully the procedures used in each stage of the research. It covers four of the funds selected that are two from Bond funds and the other two from Equity fund.

Chapter Four - Analysis of the Results: This chapter cover the results gained from the test conducted based on the different testing methods used.

Chapter Five - Conclusion, and Summaries: upon the findings of chapter four, conclusion and recommendations are made. Furthermore, directions for further analysis are discussed.

CHAPTER TWO

LITERATURE REVIEW

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The development of the Capital Assets Pricing Model (CAPM) in the mid 1960s, provided financial economists with a tool for adjusting returns for risk. An important application of this model, is the evaluation of the performance of managed portfolio. (Grinblatt and Titman, 1994, p.419).

A number of empirical studies were conducted to evaluate the performance of the mutual funds based on the different techniques. Grinblatt and Sheridan Titman conducted one of such studies in 1994. They were contrasting the Jensen measure and Treynor measure on a sample of 279 mutual funds and 109 passive portfolios using a variety of benchmark portfolios. The study concluded that using different techniques to evaluate the mutual funds performance and the same benchmark, the results are similar. However, using different techniques and different benchmarks, this will have different results with regard to the mutual funds performance evaluation. The two major reasons for this controversy are the benchmark efficiency and the different evaluation techniques used.

Grinblatt and Titman (1994) found that the choice of a benchmark can have a large effect on inferences about performance. However, this does not mean that all results about mutual funds performance are spurious. Rather, it means that care must be taken to avoid inefficient benchmarks. For instance, in their study the mutual funds displayed strong negative performance on average, with all the benchmarks and virtually zero performance with the benchmark formed from securities characteristics.

This difference is most probably due to the size-related biases of the benchmarks.

In Grinblatt and Titman (1994) sample period, the stocks of large firms perform poorly relative to these benchmarks and as a result, mutual funds, which on average purchase larger than average stock also perform poorly relative to those benchmarks. In addition to affecting average performance, benchmarks have a large effect on how funds perform relative to each other.

In particular, the correlation between the performance numbers generated by the characteristics-based benchmark and those generated with other benchmarks were low.

The next part of the study examined the second source of controversy which are the different evaluation techniques.

My empirical study assesses the importance of these two issues. To assess the benchmark issue and the sensitivity of the different performance measures to the choice of the benchmark is analyzed.

2.1.1 BENCHMARK EFFICIENCY

The first source of controversy is that the CAPM approach (and analogous multi factor approaches) to performance evaluation requires the use of a benchmark portfolio(s). As Allrich (1998)(p.20) and others have noted, performance evaluation with these methods is likely to be sensitive to the benchmark choice. In particular, benchmarks that are mean-variance inefficient provide erroneous inferences. The well-known size and dividend-Yield biases, documented in tests of the CAPM, provide one set

of recipes for managers who wish to game an evaluation with CAPM-based benchmarks. (Website: Information Content of the efficient frontier).

To assess the benchmark issue, the sensitivity of the different performance measures to the choice of the benchmark is analyzed. The benchmarks examined are: The MSCI World Index, MSCI Equity Index and MSCI Emerging Market Index.

The Morgan Stanley Capital International (MSCI) indices were the first international benchmarks constructed to fulfill investors' growing need to accurately compare the stock markets of different countries. MSCI that is based in New York with sales offices in three continents, has covered the world's developed market since 1968. In 1988, MSCI began coverage of the emerging markets. Currently, MSCI covers over 1700 securities in 28 emerging market and 2600 securities in 23 developed markets totaling over \$15 trillion in marketcap. Investment professionals around the world use MSCI data for a variety of purposes such as performance measurement, stock valuation, asset allocation and backtesting. "Internet Website: Morgan Stanley Capital International".

Although local stock exchanges calculate their own indices, these are generally not comparable with one another due to differences in the representation of the local market, mathematical formulas, base dates and methods of adjusting for capital changes. MSCI applies the same selection criteria and calculation methodology across all markets for all indices, developed and emerging. (Internet Website: Morgan Stanley Capital International).

MSCI's Developed and Emerging Market Indices reflect stock market trends by representing the evolution of an unmanaged portfolio containing

a broad selection of domestically listed companies. With a target market coverage of 60%, the MSCI Indices balance the inclusiveness of an “all share” index against the instability of a “blue chip” index. (Internet Website: Morgan Stanley Capital International).

MSCI is most known for its global indices and is used as a performance benchmark by 98% of US investment managers investing in the developed markets. Since index returns (price or total - with gross or net dividends reinvested) have been calculated daily since 1968 for most developed markets, many investment professionals find the data useful for correlation matrices, volatility (risk) measures and performance attribution. “Internet Website: Morgan Stanley Capital International”.

2.1.2 EVALUATION TECHNIQUES

The second source of controversy in this literature is a statistical bias in the evaluation techniques that arises using different measures.

To assess this issue, two techniques are used: the Sharpe Measure and the Treynor Measure.

2.1.2.1 SHARPE PERFORMANCE INDEX

Using the concepts of the capital market line, Sharpe suggested that historical performance be calculated as “the return earned for bearing risk per unit of total risk. “Radcliffe, 1990 (p.286)”.

This measures the distance of the Funds from the Benchmark’s security market line. If the number is positive, the fund surpassed the benchmark portfolio, if negative, then the fund was beaten.

As per Radcliffe (1990), the Sharpe performance index for the mutual fund should be compared with that of other funds as well as that of the aggregate market. The larger particular fund's Sharpe index relative to the market and other funds, the better is performance.

2.1.2.2 TREYNOR'S PERFORMANCE INDEX

Treynor chose to treat only the nondiversifiable market risk of any investment. (Radcliffe, 1990, p. 287).

Instead of using sigma as risk measure, one uses Beta. You set the benchmark's $\text{Beta} = 1$ and calculate the slope. Then calculate the Beta of portfolio and resulting slope. The fund with the higher slope is considered superior.

One of the fiercest controversies swirling around mutual fund investing is whether or not market timing works. As it is often the case with controversies, both sides make good points, and the truth is probably subtle and shaded.

Market-timing means lightening up on certain investments when you think they are about to decline or have just begun to decline and loading up on certain investments when you think they are about to go up or have just begun their ascent. A market-timer in blue-chip stocks; ideally, would have invested in August of 1982 and sold out in August of 1987. (Borosan, 1992).

Predictably, there is a continuum of market-timers. Over on one side are investors whose idea of market-timing is to have a mere 10% or 20% of their stock-market investments in cash if they're worried as opposed to their usual strategy of being fully invested or having only 5% in cash. On

the opposing side are the aggressive market-timers that are 100% in cash when they think that stocks are in or are entering a bear market. (Boroson, 1992).

Making everything more confusing are the indirect market-timers. When they see relatively few undervalued securities, they stop buying and build up their cash reserves. They claim they are not market-timers, but they sure quack like them.

2.2 SUMMARY

Therefore, two of the major contributions to the mutual funds performance evaluation are the benchmark efficiency and the performance technique being used. This was evaluated as part of Grinblatt and Titman empirical study in which they have included some other contributions as well. The contribution under this paper's study is that, measures have similar inferences when using the same benchmarks.

To examine the conclusions derived by Grinblatt and Titman, a test will be conducted on four different mutual funds with different indices. Chapter three will start by describing the methodology used to perform the test.

CHAPTER THREE

METHODOLOGY

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter explains the methods used to test the validity of the two major reasons effecting the performance evaluation of the mutual funds.

The following steps have been performed:

- Selected the funds to be examined.
- Selected the time period for the test.
- Selected the benchmark to evaluate the performance of the funds specified.
- Selected the different techniques to evaluate the performance.

3.2 FUNDS UNDER TEST

To test how the performance results vary from one technique and another using same benchmarks and different benchmarks, I have selected the following funds:

1. Global Bond Fund (A)
2. Global Bond Fund (B)
3. Global Equity Fund (A)
4. Global Equity Fund (B)

The funds have been selected from the international market. As mentioned earlier in Chapter one and two that those specific funds have been used to have different types of funds with different characteristics and asset allocations under this empirical study.

To have an overview of the Bond Fund and Equity Fund prior the move to the specific characteristics, please refer to appendix A for more details on the Bond and Equity fund characteristics.

3.2.1 GLOBAL BOND FUND (A)

This fund is an open-ended mutual fund holding a globally diversified portfolio of fixed-interest investments. These will normally consist of bonds issued by governments, public authorities and corporations, denominated in the fund currency (US\$) as well as other currencies.

The fund is suitable for investors who seek:

- To diversify their fixed income assets and currency exposure.
- Capital appreciation over a medium to long-term time horizon.
- Fixed-income investment opportunities.

Portfolio Composition

For this specific fund, the portfolio asset allocation can be viewed in two ways that are by Maturity and by Currency.

This fund is presented in Graph 1 and table 1, the maturity asset allocation, while Graph 2 and table 2 describes the fund in currency based asset allocation.

Therefore, the fund consists of global bonds in 6 major currencies and different maturities ranging from short to long term. This explains the diversification that the fund presents.

Graph # 1: Portfolio Composition by Maturity for Global Bond Fund (A)

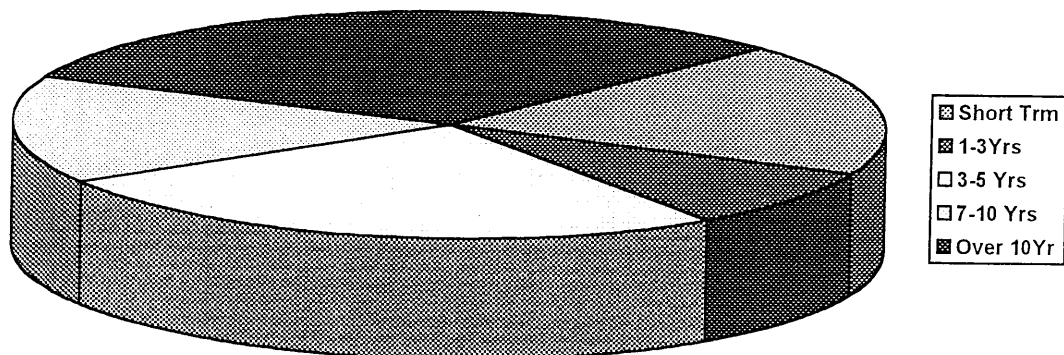


Table # 1: Portfolio Composition by Maturity for Global Bond Fund (A)

Maturity	% of allocation
Short Term Investments	19.0%
1 - 3 Years	8.5%
3 - 5 Years	25.9%
7 - 10 Years	15.1%
Over 10 Years	31.5%

Source: The Monthly Fund Report, July 1998, Micropal

Graph # 2: Portfolio composition by Currency for Global Bond Fund (A)

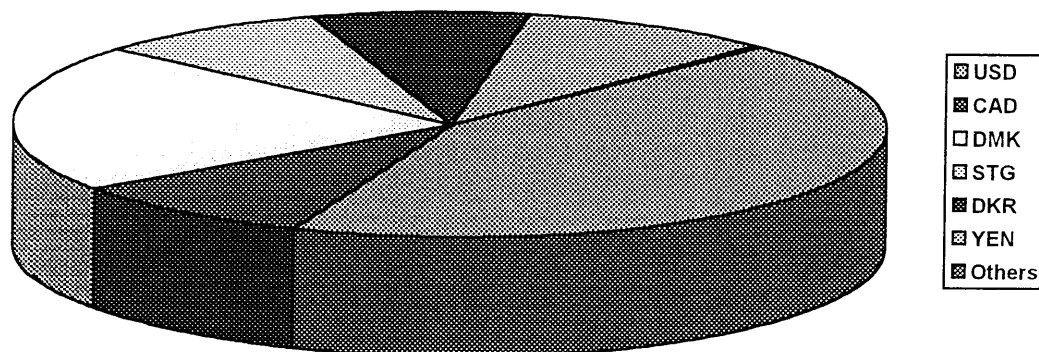


Table # 2: Portfolio composition by Currency for Global Bond Fund (A)

Currency	% of allocation
US Dollar	35.5%
Canadian Dollar	7.6%
Dutch Mark	17.3%
Pound Sterling	7.1%
Denmark Korona	6.7%
Japanese Yen	7.7%
Others	18.1%

Source: The Monthly Fund Report, January 1998, Micropal

3.2.2 GLOBAL BOND FUND (B)

The fund invests in domestic and international fixed income securities and money market instruments. The investments are made after analyzing interest rate movement; supplemented with active currency management.

The fund is suitable for investors who seek:

- Capital growth over a medium - to long - term horizon.
- Returns equal or superior to those of the markets invested in.
- Diversification of assets.

Portfolio Composition

The portfolio allocation is viewed in two different ways:

1. By Securities
2. By Currency

The fund is presented in Graph 3 and table 3 by the country security where 8 countries are involved. Graph 4 and table 4 presents the fund in terms of currency asset allocation. This fund like fund A consists of Global Bonds.

Graph # 3: Portfolio composition by Securities for Global Bond Fund (B)

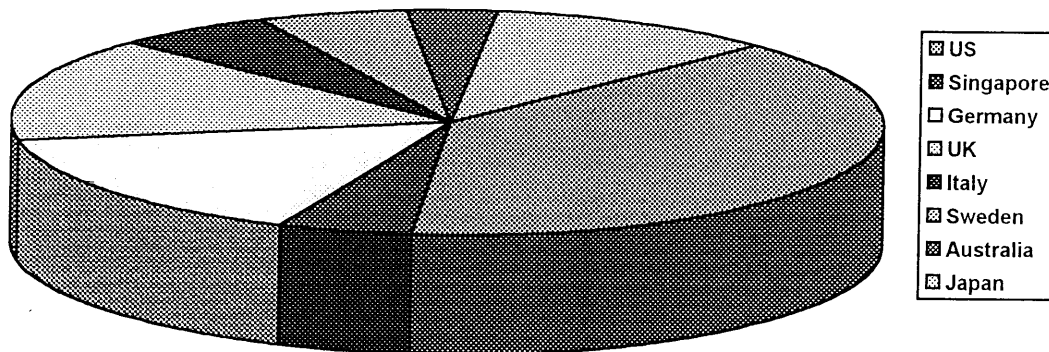


Table # 3: Portfolio Composition by Securities for Global Bond Fund (B)

Security	% of allocation
USA	39.0%
Singapore	5.0%
Germany	15.4%
UK	15.1%
Italy	5.7%
Sweden	5.7%
Australia	3.3%
Japan	10.8%

Source: The Monthly Fund Report, July 1998, Micropal

Graph # 4: Portfolio Composition by Currency for Global Bond Fund (B)

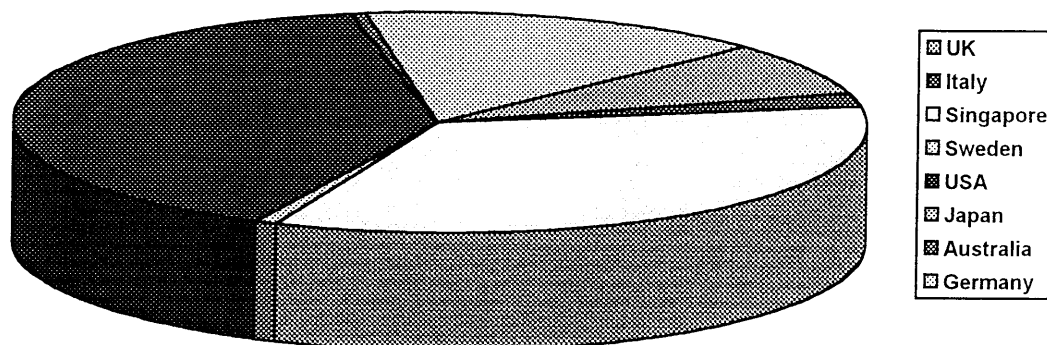


Table # 4: Portfolio composition by Currency for Global Bond Fund (B)

Currency	% of allocation
Germany	15.4%
UK	7.8%
Italy	1.9%
Singapore	34.0%
Sweden	5.7%
USA	39.8%
Japan	0.1%
Australia	0.3%

Source: The Monthly Fund Report, July 1998, Micropal

3.2.3 EQUITY FUND (A)

An open-ended mutual fund holding a diversified portfolio primarily of high-quality European equities and securities convertible into equity shares. The fund's assets are managed and allocated based on assessment of currencies, equity markets and individual securities through Europe.

The fund is suitable for investors who seek:

- Investment opportunities in Europe.
- Capital appreciation over a medium- to long - term time horizon.
- Risk diversification.

PORTFOLIO COMPOSITION

The asset allocation is viewed in terms of Country allocation or Industry breakdown.

Graph 5 and Table 5 presents the fund in terms of country allocation where the concentration is in European countries. Graph 6 and Table 6 presents the same fund in terms of industry allocation with seven different industries. This fund is mainly equity fund.

Graph # 5: Portfolio composition by country for Equity fund (A)

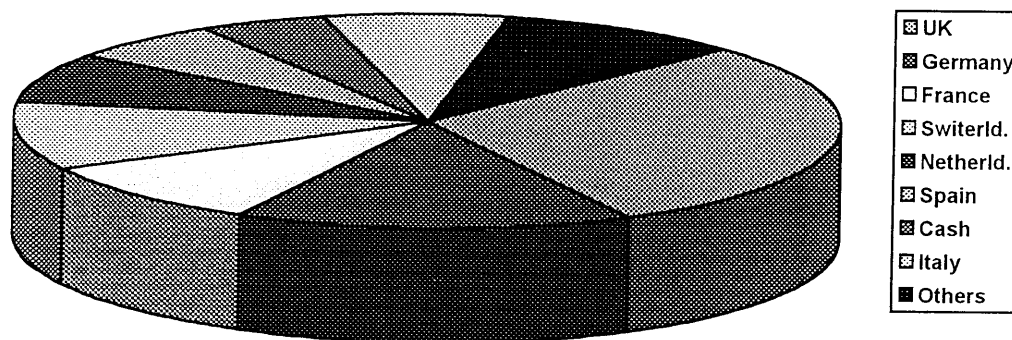


Table # 5: Portfolio Composition by Country allocation for Equity Fund (A)

Country	% of allocation
UK	28.4%
Germany	14.2%
France	8.4%
Switzerland	9.2%
Netherlands	6.9%
Spain	5.5%
Cash	4.3%
Italy	6.6%
Others	8.5%

Source: The Monthly Fund Report, July 1998, Micropal

Graph # 6: Portfolio composition by Industry for Equity Fund (A)

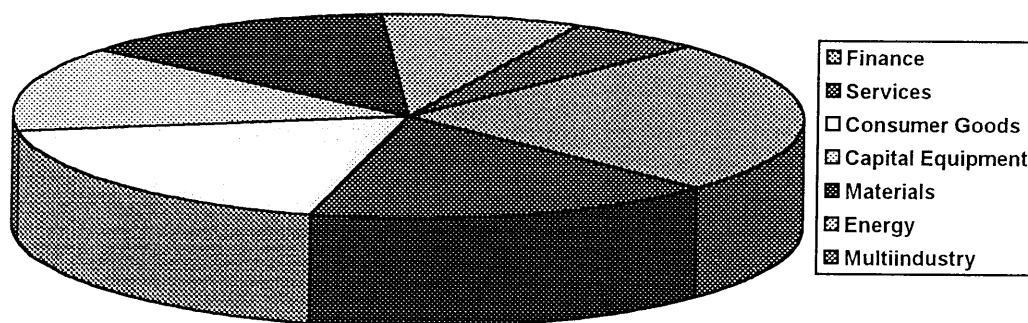


Table # 6: Portfolio composition by Industry for Equity Fund (A)

Industry	% of allocation
Finance	24.4%
Services	17%
Consumer Goods	18.2%
Capital Equipment	13.8%
Materials	13.1%
Energy	8%
Multiindustry	5.5%

Source: The Monthly Fund Report, July 1998, Micropal

3.2.4 EQUITY FUND (B)

An open-ended mutual fund which aims to provide long-term capital growth through the allocation and management of equity investments in a diversified group of emerging markets around the world, including, but not limited to those which are categorized by the World Bank as “low” or “middle” income countries.

The fund is suitable for investors who seek:

- To diversify their assets across a broad range of developing economies.
- Long-term capital growth.

Investors who are willing:

- to accept the higher degree of risk associated with emerging market investments.
- to take a long-term view.

PORTFOLIO COMPOSITION

The portfolio allocation can be viewed in the following ways:

1. Country allocation
2. Industry Breakdown

Graph 7 and Table 7 presents the fund in country allocation with eleven major country. Simultaneously, Graph 8 and Table 8 present the fund in terms of industry allocation. This differs from Equity fund A in that the country concentration is in emerging markets unlike equity A where the concentration is in Europe.

Graph # 7: Portfolio composition by Country for Equity Fund (B)

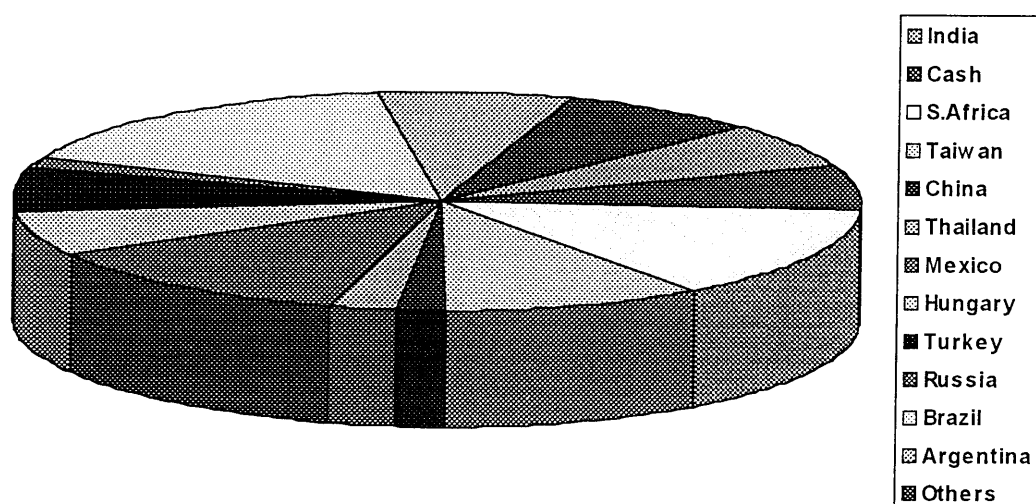


Table # 7: Portfolio composition by Country for Equity Fund (B)

Country	% of allocation
India	6.4%
Cash	6.5%
South Africa	13.4%
Taiwan	9.8%
China	2%
Thailand	2.3%
Mexico	12%
Hungary	6.4%
Turkey	1.5%
Russia	1.5%
Brazil	16%
Argentina	7.2%
Others	7.3%

Source: The Monthly Fund Report, July 1998, Micropal

Graph # 8: Portfolio composition by Industry for Equity Fund (B)

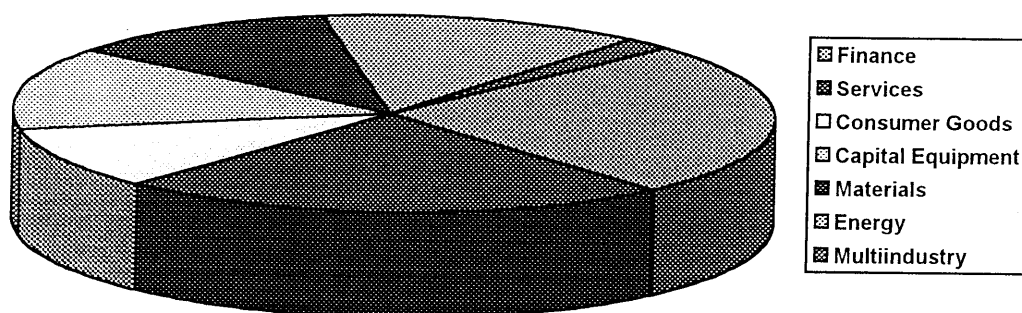


Table # 8: Portfolio Composition by Industry for Equity Fund (B)

Industry	% of allocation
Finance	25.6%
Services	23.6%
Consumer Goods	10.1%
Capital Equipment	13.5%
Materials	11.7%
Energy	13.5%
Multiindustry	2%

Source: The Monthly Fund Report, July 1998, Micropal

3.3 SELECTION OF TEST TIME PERIOD

The funds that have been selected are being tested for the periods since inception date. The performance is being evaluated based on the period specified as below:

Global Bond Fund (A): From 1993 to 1997

Global Bond Fund (B): From 1993 to 1997

Equity Fund (A): From 1993 to 1997

Equity Fund (B): From 1993 to 1997

A quarterly data was used to calculate the portfolio return and the standard deviation.

3.4 SELECTION OF BENCHMARK

In order to evaluate the funds performance from period to period and the strategies followed, different benchmarks were selected. Based on the country of trading, the benchmarks of the World Indices were chosen which are the most accepted comprehensive indices among international investors.

The following international indices were selected:

1. Global Bond Fund (A): MSCI, The World Index
2. Global Bond Fund (B): MSCI, The World Index
3. Equity Fund (A): MSCI, Europe Index, And MSCI World Index
4. Equity Fund (B): MSCI, Emerging Market Index, And MSCI World Index

3.5 MODELS USED FOR PERFORMANCE EVALUATION

Two models have been used to evaluate the performance of the Funds beside to test the validity of the hypothesis. The following are the two models applied:

1. Sharpe Measure.
2. Treynors Measure.

One assumption that is used in this research is that, the Risk Free rate has been the average quarterly T-Bill for the period over which the fund is being considered.

3.5.1 SHARPE PERFORMANCE INDEX

This measures the distance of the Funds from the Benchmark's security market line. If the number is positive, the fund surpassed the benchmark portfolio, if negative, then the fund was beaten. (Booth, 1991).

Using the concepts of the capital market line, Sharpe suggested that historical performance can be calculated as "the return earned for bearing risk per unit of total risk. Symbolically, the Sharpe index is calculated as follow:

$$\frac{(\text{Average Portfolio Return} - \text{Average Risk Free Rate})}{\text{Standard Deviation of the Portfolio}}$$

Standard Deviation of the Portfolio

The Sharpe performance index for the mutual fund should be compared with that of other funds as well as that of the aggregate market. The larger a particular fund's Sharpe index relative to the market and other funds, the better its performance. (Booth, 1991).

3.5.2 TREYNOR'S SLOPE

Instead of using sigma as risk measure, one uses beta. You set the benchmark's $\beta = 1$ and calculate the slope (Realized Return-Risk Free)/Beta. Then calculate the beta of the portfolio ($\sigma_{\text{benchmark}} \times \sigma_{\text{fund}} / \sigma_{\text{benchmark}}^2$) and resulting slope. The fund with the higher slope is considered superior. (Booth, 1991).

Treynor chose to treat only the nondiversifiable market risk of an investment and developed the following performance index:

(Average Portfolio Return - Average Risk Free Rate)

Beta of the Fund

The Treynor index treats only that portion of a portfolio's historical risk, which is important to investors as estimated by Beta of Fund and neglects any diversifiable risk. As such, it is a general performance measure, which can be used regardless of any other securities an investor might own, or the extent of diversification in the portfolio being evaluated. This nondiversifiable past risk is measured as Beta of the portfolio, the historical beta of the investment's returns. Treynor is a relative measure and must be compared with the values of other funds as well as the aggregate market in order to determine how well an investment actually fared. (Burden and Douglas, 1996).

3.6 FUND MONITOR

This quantitative analysis makes use of data to end of December 1997, and focuses on three standard measurements of performance:

1. Total return on quarterly basis versus is the relevant index. All return data are measured in US Dollar term's offer-to-offer prices on a dealing date basis. For funds, returns include gross dividends reinvestments. For indices, total return indices are used if they are available.

2. Standard Deviation measures the variation of the component annually returns.
3. Correlation Coefficient measures the extent to which a fund moves with the index. The calculation is based on monthly percentage change in the index and the fund. The larger the coefficient, the higher the correlation between the index and the fund. (Francis and Taylor, 1994).

3.7 SUMMARY

In this chapter I have covered the methodology used to conduct this study. The first step is to choose four different funds having different characteristics. Those funds are Global Bond Fund A, Global Bond Fund B, Equity Fund A, and Equity Fund B. The second step is to select the time period which is five year on quarterly basis from 1993 to 1997. The third step is to select the benchmark that are MSCI World Index, MSCI Europe Index and MSCI Emerging Market Index. The final step is choosing the techniques used for the performance evaluation. Those techniques are Sharpe and Treynor.

As seen from Chapter three, the type of different funds chosen with the reasons and that different benchmarks are selected to be suitable to the funds for performance evaluation purposes. Each benchmark should encompass with almost similar allocation as the fund.

In Chapter four, the next chapter, I will be analyzing the results achieved based on the steps followed in chapter three.

CHAPTER FOUR

ANALYSIS OF

RESEARCH FINDINGS

CHAPTER FOUR

ANALYSIS OF THE RESEARCH FINDINGS

4.1 INTRODUCTION

In this chapter, applying the Sharp's is testing the research hypothesis outlined in Chapter Three "Methodology" and Treynor's models described in the previous chapter.

The analysis of the findings are presented under the following steps:

1. The returns of each fund over the period of test.
2. The calculation of the fund's standard deviation.
3. Implementation of the Sharpe Measure and Treynor Measure.
4. Evaluation of the results.

The performance measures are typically used to evaluate the risk/return performance of the mutual funds. The two basic performance models used in the analysis are The Sharpe Model and the Treynor Model.

The most difficult point of this examination is to determine how to evaluate the results (Grossman, 1995). Generally speaking, there are several methods of evaluating portfolio performance. These evaluation methods are as follow:

I - The Sharpe Performance Index.

II - The Treynor Performance Index.

In this research, the measure will be compared with the aggregate market only in both evaluation methods. The Market indices used are as follow:

1. Morgan Stanley Capital International (MSCI) the World Index for Global Bond Funds A and B.
2. Morgan Stanley Capital International (MSCI) Europe Market Index for Global Equity Fund A.
3. Morgan Stanley Capital International (MSCI) Emerging Market Index for Global Equity Fund B.
4. Morgan Stanley Capital International (MSCI) the World Index for Global Equity Funds A and B.

4.1.1 GLOBAL BOND FUND (A)

Table # 9: Summary results of Global Bond Fund (A)

	Global Bond Fund (A)	MSCI World Index
Average	1.895	2.48
Standard Deviation	1.801015795	3.519779089
Variance	3.243657895	12.38884483
Correlation Coefficient	0.321957891	
Sharpe Performance Index	0.435865139	0.22302536
Treynor Performance Index	4.765061042	0.785

“For more details, please refer to Appendix B”.

The Global Bond Fund (A) was superior in 11 periods over the 20 quarters examined in the research. The quarters for which the Fund was superior are:

March 93, June 93, September 93, December 93, September 94, December 94, March 95, September 96, March 97, September 97 and

December 97. However, the Market was superior in the remaining of the quarters.

I - Sharpe Index: Considering the Sharpe Index, the fund has done 0.4358 that is better than the market (MSCI) that performed 0.2230.

II - Treynor Index: Considering the Treynor Index, the fund has done 4.7650 which is well better than the market (MSCI) that performed 0.785.

Therefore, considering the sensitivity of the fund's performance to the measures used, it is found that for both Sharpe and Treynor, the fund outperformed the market as per the results obtained. In this case, Sharpe and Treynor have no major difference. The difference occurs when the funds are not perfectly diversified.

Considering the outcome that Grinblatt and Titman (1994) arrived at is that the performance of the fund has similar results when using measures of generally similar inferences and comparing to the same benchmark. The evaluation of Global Bond Fund (A) concluded the same.

4.1.2 GLOBAL BOND FUND (B)

Table # 10: Summary results of Global Bond Fund (B)

	Global Bond Fund (B)	MSCI World Index
Average	3.839	2.48
Standard Deviation	4.371682682	3.519779089
Variance	19.11160947	12.38884483
Correlation Coefficient	0.674292849	
Sharpe Performance Index	0.624244758	0.77533275
Treynor Performance Index	3.258530251	2.729

"For more details, please refer to appendix B"

The Global Bond Fund (B) was superior in 12 periods to the market (MSCI) over the following quarters:

March 93, June 93, September 93, December 93, September 94, March 95, June 95, September 96, December 96, March 97, June 97 and December 97. While the MSCI was superior in the remaining eight quarters.

Although the fund was superior in quarters more than the market, however, taking the performance valuation methods, two different results occurred.

I - Sharpe Index: The market has performed better for which MSCI was 0.7753 while the fund has done 0.62424.

II - Treynor Index: The fund has performed better than MSCI. The fund's Treynor index was 3.2585 while the MSCI was 2.729.

The same results of Global Bond Fund (A) are arrived at for Global Bond Fund (B) as those were tested to emphasize the effect of using different measures to the performance evaluation of the fund.

It is concluded that when using measures of generally similar inferences, like in this test, Sharpe and Treynor, the evaluation results are similar. This can be seen from Table 10 where the Fund performed 0.624 in Sharpe compared to 3.258 in Treynor with Market performance of 0.7753 in Sharpe and 2.729 in Treynor respectively. Therefore, the fund outperformed the market in Sharpe and Treynor using the same benchmark.

4.1.3 GLOBAL EQUITY FUND (A)

4.1.3.1 GLOBAL EQUITY FUND (A) USING MSCI EUROPEAN INDEX

Table # 11: Summary Results of Global Equity Fund (A)

	Global EQUITY Fund (A)	MSCI EUROPEAN Index
Average	3.605	3.56
Standard Deviation	3.872804641	3.290284565
Variance	14.99861579	10.82597252
Correlation Coefficient	-0.00551855	
Sharpe Performance Index	0.644235956	0.758293075
Treynor Performance Index	-0.016206442	2.495

“For more details, please refer to Appendix B”

Using the MSCI European Index:

The Global Equity Fund (A) outperformed the MSCI in nine quarters over the period of March 93 to December 97. The quarters were as follow:

June 93, September 93, March 94, September 94, December 94, December 95, June 96, September 96 and December 97.

In examining the performance evaluation methods, the market was superior in both the methods:

I - Sharpe Index: The market performed 0.7582 while the fund performed 0.6442 over the examined period.

II - Treynor Index: The market performed 2.495 while the fund performed a negative result of -0.0162.

For Global Equity Fund (A) two parts of the test will be conducted. The first part is to emphasize the effect of using different measures and compares it to the same benchmark. In Table 11, we have used Sharpe and Treynor and compared it to MSCI European Index.

The results have shown that the market outperformed the fund in both cases of the measures ;i.e., Sharpe and Treynor against MSCI European Index.

The second part of the test is to validate the effect of using different benchmark to the results of the evaluation. This is conducted in the following section where Global Equity Fund (A) have been evaluated using Sharpe and Treynor against MSCI World Index. To check the results, please refer to Table 12.

4.1.3.2 GLOBAL EQUITY FUND (A) USING MSCI WORLD INDEX

Table # 12: Summary Results of Global Equity Fund (A)

	Global EQUITY Fund (A)	MSCI WORLD Index
Average	3.605	2.48
Standard Deviation	3.872804641	3.519779089
Variance	14.99861579	12.38884483
Correlation Coefficient	-0.040632101	
Sharpe Performance Index	0.930849948	1.024212006
Treynor Performance Index	-80.63541153	3.605

“For more details, please refer to Appendix B”

In examining the performance evaluation methods, the market was superior in both the methods:

I - Sharpe Index: The market performed 1.024 while the fund performed 0.9308 over the examined period.

II - Treynor Index: The market performed 3.605 while the fund performed a negative result of -80.635.

Comparing the Sharpe index results using MSCI Europe Index against Sharpe Index results using MSCI World Index, we notice that in both cases the market was outperforming the funds.

Although the market was outperforming the fund in both cases against MSCI World and MSCI Europe, there was quite a large difference between the fund performance in Treynor using MSCI Europe to MSCI World. This can be noticed from Table 11 and Table 12 where the fund under Treynor using MSCI Europe resulted at -0.0162 while it performed -80.635 with MSCI World Index.

This could be explained by the fact that the Global Equity Fund (A) is concentrated on European market while MSCI World Index is a global index with no concentration to specific region. Therefore, the conclusion that Grinblatt and Titman arrived at is that the evaluation results will be different using different benchmarks although we are using measures of similar inferences.

4.1.4 GLOBAL EQUITY FUND (B)

4.1.4.1 GLOBAL EQUITY FUND (B) USING MSCI EMERGING MARKET INDEX

Table # 13: Summary Results for Global Equity Fund (B)

	Global EQUITY Fund (B)	MSCI EMERGING MARKET
Average	2.829	1.98
Standard Deviation	6.016519277	12.30969734
Variance	36.19850421	151.5286486
Correlation Coefficient	0.175797003	
Sharpe Performance Index	0.28571337	0.139646
Treynor Performance Index	20.00628595	1.719

“For more details, please refer to Appendix B”

Using MSCI Emerging Market Index:

In the Global Equity Fund (B), the fund was superior in six quarters only compared to the market which was superior in fourteen quarters. The fund was superior in:

March 94, September 95, September 96, December 96, September 97 and December 97.

The fund outperformed the market in both the performance evaluation methods:

I - Sharpe Index: The fund resulted in 0.2857 compared to MSCI that resulted in 0.1396.

II - Treynor Index: The fund resulted in 20.0062 compared to MSCI that resulted in 1.719.

Performing two tests for Global Equity Fund (B) to validate Grinblatt and Titman (1994) conclusions, we have tested the fund first using different measures and same benchmark; i.e., MSCI Emerging Market Index, then secondly, using the same measures with different benchmark; i.e., MSCI World Index.

In Table 13 it is found that the fund outperformed the market in both measures. With Sharpe it resulted to 0.2857 compared to 0.13964 for the market and 20.006 in Treynor compared to 1.719 for the market.

Table 14 illustrates the second part of the test where Sharpe and Treynor are compared to MSCI World Index.

4.1.4.2 GLOBAL EQUITY FUND (B) USING MSCI WORLD INDEX

Table # 14: Summary Results of Global Equity Fund (B)

	Global EQUITY Fund (B)	MSCI WORLD INDEX
Average	2.829	2.48
Standard Deviation	6.016519277	3.519779089
Variance	36.19850421	12.38884483
Correlation Coefficient	-0.448016792	
Sharpe Performance Index	0.470205424	0.803743624
Treynor Performance Index	-3.694100862	2.829

“For more details, please refer to Appendix B”

The market outperformed the fund in Sharpe and Treynor using MSCI World Index compared to MSCI Emerging Market. The reason is that MSCI Emerging Market Index is more specific than the MSCI World is. Therefore, there is that difference in the results.

4.5 SUMMARY RESULTS OF THE FOUR FUNDS IN COMPARISON

Table # 15: Summary Statistics results of the four funds examined.

Fund	Fund Performance	MSCI Performance
<u>Global Bond Fund A</u>		
Sharpe with MSCI World	0.435865139	0.22302536
Treynor with MSCI World	4.76506102	0.785
<u>Global Bond Fund B</u>		
Sharpe with MSCI World	0.624244758	0.77533275
Treynor with MSCI World	3.258530251	2.729
<u>Global Equity Fund A</u>		
Sharpe with MSCI Europe	0.644235956	0.758293075
Treynor with MSCI Europe	-0.016206442	2.495
Sharpe with MSCI World	0.930849948	1.024212006
Treynor with MSCI World	-80.63541153	3.605
<u>Global Equity Fund B</u>		
Sharpe with MSCI EM	0.28571337	0.139646
Treynor with MSCI EM	20.00628595	1.719
Sharpe with MSCI World	0.470205424	0.803743624
Treynor with MSCI World	-3.694100862	2.829

The first two funds that are Global Bond (A) and Global Bond (B) have been examined to assess the contribution of the different measures to the performance evaluation using the same benchmark. It is noticed that whether using Sharpe or Treynor the results are same as long as the same benchmark is used. This can be explained by the figures in table # 15.

The other two funds, that are Global Equity Fund (A) and Global Equity Fund (B) where examined to assess the contribution of using different

CHAPTER FIVE

CONCLUSION &

SUMMARIES

CHAPTER FIVE

CONCLUSIONS AND SUMMARIES

With reference to the empirical study conducted by Grinblatt and Titman (1994), the approach to evaluating portfolio performance has been subject to a great deal of controversy. Those were three major controversy: benchmark efficiency, measures, and the characteristics of the mutual funds.

The outcome of the study was that using measures of similar inferences have no great effect on the performance evaluation of the fund if compared to the same benchmark, however, when using different benchmarks, then the effect will be significant. The other controversy was that the performance is positively related to the fund turnover. However, this later controversy was not considered nor tested in my study.

My study contained two contributions to the portfolio performance evaluation. First, it examined the sensitivity of performance inferences to benchmark choice. Second, it compared the Sharpe Measure to Treynor Measure.

It is found that the choice of a benchmark can have a large effect on inferences about performance. However, this does not mean that all results about mutual fund performance are spurious. Rather, it means that care must be taken to avoid inefficient benchmarks. For instance, the mutual funds display strong negative performance when testing Global Equity Fund (A) under the Treynor Measure using MSCI World Index compared to MSCI Europe Index.

The other conclusion that was arrived at is that the different measures used in this paper; i.e., Sharpe and Treynor, displayed high cross-sectional correlation's. This suggests that the measures that eliminate the timing-related problem will yield almost identical inferences. We believe, however, that the measures are significantly different for those that appear to have successfully timed the market.

The performance, on average, whether Sharpe or Treynor index and virtually zero performance with a benchmark formed from the securities characteristics. (Mackinlay, 1995).

Therefore, the results found are related to the conclusions of Grinblatt and Titman (1994).

GLOSSARY

GLOSSARY

Adviser A company that a mutual fund employs to manage the fund's investments.

Alpha Number that measures how well a fund has performed, considering its volatility. An Alpha above 0 is considered desirable.

Appreciation Growth in value of an asset.

Asset Allocation Fund A fund that either keeps a fixed percentage of its assets in various instruments-bonds, stocks, precious-metals stocks, real-estate stocks-or varies the percentages, depending on where the fund managers think the investment markets are heading. A true asset-allocation fund has some investments in inflation-resistant hard assets (precious metals, real estate).

Beta coefficient Number that measures how volatile a stock or a mutual fund is. The Standard & Poor's 500 is given a beta of 1. A stock or fund with a beta of 1.20 bobs up and down 20% more; a stock or fund with a beta of 0.80 bobs up and down 20% less. Beta is sometimes equated with riskiness.

Basic value investing Investment strategy that concentrates on buying seemingly undervalued stocks, based on their price-earnings ratio, price to book value, and other indicators.

Blue Chip Stock of a large, prospectus, well-established company. The 30 stocks in the Dow Jones Industrial Average-including IBM, AT&T, Exxon-are unquestionably blue chips.

Bond A debt instrument that pays a regular interest, whether or not the company issuing the bond is making money. Debt instruments are

“senior” securities: Their holders must be paid before a company pays owners of its stock.

Bond Fund A fund that invests mainly in corporate, municipal, U.S. Treasury securities. Such a fund emphasizes income rather than capital gains.

Buy and Hold Investment strategy that entails buying shares of stock or a mutual fund for the long term and selling them only in special circumstances, such as after a long-term loss.

Closed Fund A fund that has stopped issuing new shares. Funds close either because they are so large that the managers cannot find enough good investments, or because the manager prefers investing only in small companies, and cannot cope with large amounts of money.

Diversification spreading investments over a variety of different securities, to reduce risk.

Efficient Market Theory that all securities are properly priced, and investors will do better than average only in proportion to the extra risks they take.

Global Fund A fund that invests in both U.S. and foreign securities.

Index model of an investment market - stocks, bonds, utilities, health-care stocks, and so forth.

International Fund A fund that invests in the securities of foreign corporations or governments.

Market Timing Attempting to buy securities near the end of a bear market, and to sell them near the end of a bull market - in other words, to buy low and sell high.

Money-Market Fund A fund that invests in debt obligations with maturities of no more than a year. To keep the principal unchanging, usually at \$1 a share, the fund varies the yield. Banks' funds are called money market deposit accounts.

Net Assets Value Price per share of a fund: net assets divided by number of shares outstanding.

Performance How well a fund has fared over a certain time period, usually measured by capital gains, dividends, and interest the fund has earned.

Portfolio Various securities held by an individual or a fund.

Portfolio Manager Person or committee that makes buy-and-sell decisions for a fund.

Prospectus Official document describing a mutual fund. It must be furnished to investors.

Risk Either the volatility of an investment, or the possibility that the investment will lose value.

Securities Stocks, bonds, options, warrants, or other instruments, that signify a corporation's obligations to an investor.

Total Return Profit or loss that a mutual fund has achieved over a period of time, including capital gains or losses, interest and dividends, and expenses. It is expressed as a percentage of the original value of the assets.

Volatility Fluctuations in the price of a security or index of securities.

REFERENCES

REFERENCES

- Allrich Ted (1998), "Split Decision", Online Investor Periodical, September and October Edition 1998, Publisher: Trade Securities, Inc. (p.20-24).
- Boroson Warren (1992), "Keys to Investing in Mutual Funds", Second Edition, Publisher: The Record, Hackensack, New Jersey. (p.13-134)
- Booth D. J. (1991), "Statistics Foundation, Instruction, Right, Start and Textbooks", Second Edition, Publisher: DP Publications Ltd. (p.202-248)
- Burden Richard and Douglas J. (1996), "Numerical Analysis", Second Edition, Publisher: Prindle, Weber and Schmidt. (p.11-22).
- Francis Jack and Taylor Richard (1994), "Theory and Problems of Investments", Publisher: McGraw-Hill International Edition. (p.130-138).
- Grinblatt and Titman (1994), "Study of Monthly Mutual Fund Returns and Performance Evaluation Techniques". Journal of Financials and Quantitative Analysis, Vol. 29 No 3 September 1994. (p.419-443)
- Grossman Sanford (1995), "Dynamic Asset Allocation and the Informational Efficiency of Markets". The Journal of Finance, Vol. L, No 3, July 1995. (p.773-785).
- Internet Website: <http://www.ms.com/mscida...> Morgan Stanley Capital International.

- Internet Website: [//www.duke.edu](http://www.duke.edu)...Information content of the efficient frontier.
- Leibowitz Martin (1994), "Study on Total Portfolio Duration: A new perspective on Asset Allocation". Journal of Financials and Quantitative Analysis. (p.139-159).
- Little Jeffrey and Rhodes Lucien (1991), "Understanding Wall Street", Third Edition, Publisher: Liberty Hall Press. (p.75-99).
- Lynch Peter and Rothchild John (1992), "One Up on Wall Street", Publisher: Penguin Books. (p.239-283).
- Mackinlay Craig (1995), "Study of Multifactor models do not explain deviations from the CAPM". Journal of Financial Economics 38 (1995). (p. 3-81).
- Morgan Stanley Capital International (1996), Quarterly Issue, Fourth Edition, Publisher: EAFE and World Perspective. (p.3-736).
- Morris Kenneth (1998), "Guide to Understanding Money and Investing in Asia". The Asian Wall Street Journal, Weekly Edition, Publisher: Lightbulb Press Inc. (p.98-115).
- Radcliffe Robert (1990), Investment Concepts, Analysis, Strategy, Third Edition, Publisher: HaperCollins. (p. 285-291).
- Zipf Robert (1995), "How the Bond Market Works", Second Edition, Publisher: New York Institute of Finance. (p. 157-171).

APPENDICES

APPENDIX A:

BOND OR FIXED INCOME FUND

In recent years, corporate bonds, municipal bonds, Ginnie Maes, U.S. Treasuries, and other fixed-income investments have become almost as volatile as stocks. Over the ten-year period from 1980 to 1991, for example, bonds appreciated as much as 31.09% in one year - and as little as 2.3% in another year. (Zipf, 1995).

Buying fixed-income investments, like corporate bonds, is not always a simple matter, either. The difference between what two different brokers may charge in commissions can be enormous. So can the "spread" - the difference between the "wholesale" price the brokerage firm pays for a bond and the "retail" price it charges you. You must also pay attention to "call" provisions, credit ratings, and maturities. (Zipf, 1995).

In general, fixed-income investments are safer than investments in equities, or stocks. When you lend money by purchasing bonds or CDs, you're less likely to lose your principal, just as you're less likely to have your principal appreciate much before the loan comes due. (But in the world of investing, there are almost always exceptions. A low-rated bond may not be as safe as a blue-chip stock; long term bonds - those that mature in ten years or more - may be more volatile than utilities or other conservative stocks. (Little and Rhodes, 1991).

All loans are called "fixed income" investments, though many yields are not really carved in stone. The interest rates on a money-market fund fluctuate from week to week; some notes have floating rates; even the yield

on a unit investment trust can change as bonds are retired. (Little and Rhodes ,1991).

When you put money into mutual funds that invest primarily in bonds and other debt instruments, you always assume certain risks:

1. Rising interest rates,
2. Creditworthiness: the corporation may get into trouble (lawsuits, poor earnings, high debts), and its bonds may lose favor with investors, or even go into default.
3. Call provisions: if a bond can be called in at the end of ten years, and interest rates have declined, the issuer will pay off the bondholders (usually at a small premium) and leave them with the task of finding other bonds with high yields even though interest rates are low.
4. “Even” risk: a company may become the subject of a takeover bid or leveraged buyout involving additional debt, so that its existing bonds are downgraded. (Boroson, 1992).

“For the different levels of Risk, please refer to Appendix A.1”.

The safest bond funds, obviously, are those that hold bonds with the shortest maturities, the highest ratings, and the strongest call protection. Most Treasuries cannot be called, and municipals rarely. Short term bonds are generally considered those with maturities of less than three years; intermediate term, three to ten years; long-term, over ten years.

EQUITY FUNDS

“Equities” are investments where you own a piece of the action - like common stocks. They’re the opposite of money you merely lend - bonds,

Treasury notes and bills, Ginnie Maes, certificates of deposit. Mutual funds that invest mostly in stocks are usually called equity funds, not stock funds, because they may own convertible bonds as well, which can be exchanged for stock at a specified price. (Borson, 1992).

Most investors in mutual funds prefer money-market funds and fixed-income funds to stock funds. Stocks scare many investors, especially since the crash of 1987. Perhaps it's because of their volatility. Perhaps it's because it's so easy to lose money in the market. (Lynch and Rothchild, 1992).

Equity fund portfolios vary, depending on the fund's investment objectives. For example, some equity funds invest in well-established companies that pay regular dividends. Others invest in young, high technology firms or companies that have been operating below expectation for several years. (Lynch and Rothchild, 1992).

Like individual investors, funds buy "Blue Chip stocks" for income and safety; "Growth stocks" for future gains; "Value Cyclical stocks" to take advantage of economic booms. The major difference in buying a fund rather than individual stocks is the diversity an investor can achieve for the same amount of money. (Lynch and Rothchild, 1992).

There are several different types of equity funds. A key distinction among them is that some stress growth, some income, and some a combination of the two. Some funds involve more risk to capital than others because they buy stock in emerging companies. The profits on all equity fund distributions are taxable, but no tax is due on the increased value of a fund until it's sold. (Lynch and Rothchild, 1992).

APPENDIX A.1:

FIGURE # 1: LITTLE RISK FUNDS

Invest Objective	Kind of fund	Fund characteristics	What the Fund buys
Steady income	US Treasury bond and agency bond	Safe government backed securities; only risks are interest rate changes and Inflation	US Treasury bonds and bonds issued by government agencies
Steady income	High rated corporate bond	Steady income and little risk	Corporate bonds, with maturities dependent on type of fund
Tax-free income	High rated municipal bond	Steady, slightly higher income and little risk	Municipal bonds in various maturities
Income	Short/inter-mediate term taxable and tax-free bond	Small risk of loss and steady, if less, income; less influenced by changes in interest rate	Different types of bonds in 1-10 year maturities, depending on type of bond
Income and currency gains	International money market	Risk tied to changes in currency value; expectation of higher return than US money markets	Non-US CDs and short-term government securities
Safety and some income	Taxable and tax-free money market	Nearly total safety of capital; income based on current interest rates	CDs and very short-term government, corporate and municipal debt

Source: Morris (1998), (p.108).

FIGURE # 2: MODERATELY RISKY

Invest Objective	Kind of fund	Fund characteristics	What the Fund buys
Strong growth plus some current income	Growth and Income	Growth as well as current income; average risk of loss	Stocks that pay high dividends and show good growth
Moderate income and good growth	Equity income	Income as well as good growth; average risk of loss	Blue-chip stocks and utilities that pay high income
Income and growth	Balanced	Reasonable income and growth; limited losses	Part stocks and preferred stocks (usually 60%) and part bonds (40%)
Primarily income	Income	Income, but with a little growth; limited losses in down market	Primarily bonds, but some dividend-paying stocks
High income	International and global bond	High income; better yield when dollar is weak and worse when dollar is strong	Bonds in overseas markets (international funds) and overseas plus US markets (global funds)
Good income and regular return of Capital	Ginnie Mae	Income and return of capital, through value and return dependent on changes in interest rates	Securities backed by a pool of government-insured mortgages
Imitate the stock market	Index	Average gains and losses for the market the index tracks	Stocks represented in the index the fund tracks

Source: Morris (1998), (p.109).

FIGURE # 3: RISKY

Invest Objective	Kind of fund	Fund characteristics	What the Fund buys
Above average long-term gains	Aggressive growth funds, also called capital appreciation funds	Very volatile and speculative; risk of above-average losses to get above-average gains; small if any dividends	Stocks of new under-valued companies expected to increase in value
Best long-term gains	Small company growth	Very volatile and speculative; risk of above-average losses to get highest gains	Stocks in small companies traded on the exchanges or over-the-counter
Hedge against turmoil in financial markets	Gold and precious metals	Extremely volatile and speculative, with big risk of loss	Stocks in gold and other precious metal mining companies and some bullion
Growth	Sector	Extremely volatile funds dependent on right market timing to produce results	Stocks in one particular industry, like energy or transportation
International growth	International equity	Volatile; gains and losses depend on stock prices and currency fluctuation	Stocks in non-US companies
Above average growth	Growth	Volatile; risk of larger losses to get higher gains	Stocks in mid-sized or large companies whose earnings are expected to rise quickly
World growth	Global Equity	Risk of larger losses in falling markets to capture gains in rising ones; risk of changes in currency values	Stocks in US and non-US companies
Highest current income	High yield bond	Very high income from high risk bonds in danger of default	Low-rated and junk corporate (taxable) and municipal (tax-free) bonds
Responsible growth	Conscience	Average growth with risk of higher losses because of restrictions on investment	Low-rated and junk corporate (taxable) and municipal (tax-free) bonds

Source: Morris (1998), (p.110).

APPENDIX B:

<u>T-Bill Rate</u>	
Average of 93	2.99
Average of 94	4.51
Average of 95	5.26
Average of 96	5.04
Average of 97	4.48
Risk Free Rate (Average)	4.456
	1.11

Annual

Quarterly

Sharpe Performance Index

$(\text{Average Fund Return} - \text{Average Risk Free Rate}) / \text{Std Deviation of the Fund return}$

Treynor Performance Index

$(\text{Average Fund Return} - \text{Average Risk Free Rate}) / \text{Beta of Fund}$

Beta of Fund

$(\text{Std Deviation of Fund} / \text{Std Deviation of Index}) \times \text{Coorelation Coefficient}$

GLOBAL BOND FUND (A):

Table # 9.a: Summary Results

Period	Fund Return %	MSCI Return %	MSCI World
Mar-93	3.4	0.90	580.01
Jun-93	2.5	0.82	585.22
Sep-93	2.6	0.24	590.01
Dec-93	1.8	1.19	591.44
Mar-94	-2.4	0.21	598.5
Jun-94	-1.2	2.58	599.74
Sep-94	0.9	1.73	615.19
Dec-94	0.4	-1.15	625.81
Mar-95	4.4	4.22	618.59
Jun-95	4.8	3.82	644.67
Sep-95	2.2	5.15	669.32
Dec-95	3.3	4.33	703.8
Mar-96	0	3.66	734.28
Jun-96	1.1	2.50	761.18
Sep-96	2.8	0.93	780.2
Dec-96	2.9	4.18	787.44
Mar-97	0.5	-0.08	820.36
Jun-97	3.1	14.65	819.68
Sep-97	2.9	2.53	939.75
Dec-97	1.9	-2.79	963.49
			936.59

Average	1.895	2.48
Standard Dev.	1.801015795	3.519779089
Variance	3.243657895	12.38884483
Corelation Coefficient	0.321957891	
Sharpe Perf.Index (Fund)	0.435865139	
Sharpe Perf. Index (MSCI)	0.22302536	
Beta of Fund	0.164740807	
Beta of Market	1	
Treynor Perf.Index (Fund)	4.765061042	
Treynor Perf.Indes (MSCI)	0.785	

"Source: MSCI data from Morgan Stanley Capital International (1996) and Website of MSCI"

GLOBAL BOND FUND (B):

Table # 10.a: Summary Results

Period	Fund Return %	MSCI Return %	MSCI World
Mar-93	7.4	0.90	580.01
Jun-93	4.1	0.82	585.22
Sep-93	6.9	0.24	590.01
Dec-93	8.9	1.19	591.44
Mar-94	-5.4	0.21	598.5
Jun-94	1.3	2.58	599.74
Sep-94	3.6	1.73	615.19
Dec-94	-1.5	-1.15	625.81
Mar-95	6.4	4.22	618.59
Jun-95	6.1	3.82	644.67
Sep-95	2.4	5.15	669.32
Dec-95	4.1	4.33	703.8
Mar-96	2.7	3.66	734.28
Jun-96	1	2.50	761.18
Sep-96	3.4	0.93	780.2
Dec-96	4.5	4.18	787.44
Mar-97	1.06	-0.08	820.36
Jun-97	16.27	14.65	819.68
Sep-97	2.25	2.53	939.75
Dec-97	1.3	-2.79	963.49
			936.59

Average	3.839	2.48
Standard Dev.	4.371682682	3.519779089
Variance	19.11160947	12.38884483
Correlation Coefficient	0.674292849	
Sharpe Perf.Index (Fund)	0.624244758	
Sharpe Perf.Index (MSCI)	0.77533275	
Beta of Fund	0.837494143	
Beta of Market	1	
Treynor Perf.Index (Fund)	3.258530251	
Treynor Perf.Indes (MSCI)	2.729	

"Source: MSCI data from Morgan Stanley Capital International (1996) and Website of MSCI"

EQUITY FUND (A):

Table # 11.a: Summary Results

Period	Fund Return %	MSCI Return %	MSCI Europe
Mar-93	0.2	1.89	530
Jun-93	8.3	1.85	540
Sep-93	4.9	2.79	550
Dec-93	7.6	9.01	565.33
Mar-94	12.1	-1.98	616.27
Jun-94	-5.9	-1.86	604.04
Sep-94	6.4	3.71	592.78
Dec-94	2.2	0.36	614.77
Mar-95	4.2	5.55	617
Jun-95	-2.6	5.69	651.25
Sep-95	4.5	3.62	688.31
Dec-95	5.2	2.84	713.21
Mar-96	2.9	3.15	733.45
Jun-96	3.9	2.06	756.57
Sep-96	4.4	3.24	772.18
Dec-96	1.2	9.02	797.23
Mar-97	1.2	4.37	869.13
Jun-97	5.4	8.44	907.15
Sep-97	1.89	7.81	983.67
Dec-97	4.11	-0.36	1060.53
			1056.66

Average	3.605	3.56
Standard Dev.	3.872804641	3.290284565
Variance	14.99861579	10.82597252
Correlation Coefficient	-0.00551855	
Sharpe Performance Index	0.644235956	
Sharpe Perf.Index (MSCI)	0.758293075	
Beta of Fund	-0.006495568	
Beta of Market	1	
Treynor Perf.Index (Fund)	-0.016206442	
Treynor Perf.Indes (MSCI)	2.495	

"Source: MSCI data from Morgan Stanley Capital International (1996) and Website of MSCI"

EQUITY FUND (B):

Table # 12.a: Summary Results

Period	Fund Return%	MSCI Return %	MSCI EM
Mar-93	1	4.35	230
Jun-93	9.1	12.50	240
Sep-93	5.6	5.87	270
Dec-93	9.2	35.47	285.86
Mar-94	19.1	-8.88	387.26
Jun-94	-8.1	1.00	352.89
Sep-94	2.7	20.64	356.42
Dec-94	6.9	-12.11	429.98
Mar-95	-4.6	-11.67	377.9
Jun-95	1.7	4.72	333.81
Sep-95	5.1	-1.10	349.56
Dec-95	2.7	-2.45	345.73
Mar-96	3.1	4.27	337.26
Jun-96	5.5	5.73	351.67
Sep-96	1	-4.28	371.83
Dec-96	2	-1.31	355.9
Mar-97	3.6	7.66	351.22
Jun-97	-6.3	8.35	378.11
Sep-97	-2.8	-9.64	409.7
Dec-97	0.08	-19.47	370.22
			298.12

Average	2.829	1.98
Standard Dev.	6.016519277	12.30969734
Variance	36.19850421	151.5286486
Correlation Coefficient	0.175797003	
Sharpe Performance Index	0.28571337	
Sharpe Perf.Index (MSCI)	0.139646	
Beta of Fund	0.085922995	
Beta of Market	1	
Treynor Perf.Index (Fund)	20.00628595	
Treynor Perf.Indes (MSCI)	1.719	

“Source: MSCI data from Morgan Stanley Capital International (1996) and Website of MSCI”

EQUITY FUND (A)

Table # 13.a: Summary Results

Period	Fund Return %	MSCI Return %	MSCI WORLD
Mar-93	0.2	0.90	580.01
Jun-93	8.3	0.82	585.22
Sep-93	4.9	0.24	590.01
Dec-93	7.6	1.19	591.44
Mar-94	12.1	0.21	598.5
Jun-94	-5.9	2.58	599.74
Sep-94	6.4	1.73	615.19
Dec-94	2.2	-1.15	625.81
Mar-95	4.2	4.22	618.59
Jun-95	-2.6	3.82	644.67
Sep-95	4.5	5.15	669.32
Dec-95	5.2	4.33	703.8
Mar-96	2.9	3.66	734.28
Jun-96	3.9	2.50	761.18
Sep-96	4.4	0.93	780.2
Dec-96	1.2	4.18	787.44
Mar-97	1.2	-0.08	820.36
Jun-97	5.4	14.65	819.68
Sep-97	1.89	2.53	939.75
Dec-97	4.11	-2.79	963.49
			936.59

Average	3.605	2.48
Standard Dev.	3.872804641	3.519779089
Variance	14.99861579	12.38884483
Correlation Coefficient	-0.040632101	
Sharpe Performance Index	0.644235956	
Sharpe Perf.Index (MSCI)	0.708851305	
Beta of Fund	-0.044707405	
Beta of Market	1	
Treynor Perf.Index (Fund)	-55.80730978	
Treynor Perf.Indes (MSCI)	2.495	

"Source: MSCI data from Morgan Stanley Capital International (1996) and Website of MSCI"

EQUITY FUND (B):

Table # 14.a: Summary Results

MSCI WORLD

Period	Fund Return %	MSCI Return %	
Mar-93	1	0.90	580.01
Jun-93	9.1	0.82	585.22
Sep-93	5.6	0.24	590.01
Dec-93	9.2	1.19	591.44
Mar-94	19.1	0.21	598.5
Jun-94	-8.1	2.58	599.74
Sep-94	2.7	1.73	615.19
Dec-94	6.9	-1.15	625.81
Mar-95	-4.6	4.22	618.59
Jun-95	1.7	3.82	644.67
Sep-95	5.1	5.15	669.32
Dec-95	2.7	4.33	703.8
Mar-96	3.1	3.66	734.28
Jun-96	5.5	2.50	761.18
Sep-96	1	0.93	780.2
Dec-96	2	4.18	787.44
Mar-97	3.6	-0.08	820.36
Jun-97	-6.3	14.65	819.68
Sep-97	-2.8	2.53	939.75
Dec-97	0.08	-2.79	963.49
			936.59

Average	2.829	2.48
Standard Dev.	6.016519277	3.519779089
Variance	36.19850421	12.38884483
Correlation Coefficient	-0.448016793	

Sharpe Performance Index	0.28571337
Sharpe Perf.Index (MSCI)	0.488382923
Beta of Fund	-0.765815582
Beta of Market	1
Treynor Perf.Index (Fund)	-2.244665741
Treynor Perf.Indes (MSCI)	1.719

“Source: MSCI data from Morgan Stanley Capital International (1996)
and Website of MSCI”