# INTERNATIONAL PORTFOLIO DIVERSIFICATION: REALITY OR MYTH

**FAZLI BIN ZAINAL ABIDIN**

**MASTER OF SCIENCE (FINANCE)**
**UNIVERSITI UTARA MALAYSIA**
**May 2009**

# INTERNATIONAL PORTFOLIO DIVERSIFICATION: REALITY OR MYTH

**Thesis submitted to the College of Business,**
**Universiti Utara Malaysia**
**in partial fulfillment for the requirement for the degree**
**Master of Science (Finance)**
**Universiti Utara Malaysia**

**By**
**Fazli Bin Zainal Abidin**

**KOLEJ PERNIAGAAN**
*(College of Business)*
Universiti Utara Malaysia

**PERAKUAN KERJA KERTAS PROJEK**
*(Certification of Project Paper)*

Saya, mengaku bertandatangan, memperakukan bahawa
*(I, the undersigned, certified that)*
**FAZLI ZAINAL ABIDIN (801417)**

Calon untuk Ijazah Sarjana
*(Candidate for the degree of)* **MASTER OF SCIENCE (FINANCE)**
telah mengemukakan kertas projek yang bertajuk
*(has presented his/her project paper of the following title)*

**INTERNATIONAL PORTFOLIO DIVERSIFICATION: REALITY OR MYTH**

Seperti yang tercatat di muka surat tajuk dan kulit kertas project
*(as it appears on the title page and front cover of the project paper)*

Bahawa kertas projek tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan.
*(that the project paper acceptable in the form and content and that a satisfactory knowledge of the field is covered by the project paper).*

Nama Penyelia : **ASSOC. PROF. DR. YUSNIDAH IBRAHIM**
*(Name of Supervisor)*

Tandatangan : _____
*(Signature)*

Tarikh : **14 MAY 2009**
*(Date)*

## PERMISSION TO USE

In presenting this thesis in partial fulfillment for the requirements of a postgraduate degree from Universiti Utara Malaysia, I hereby agree that the University Library may take it freely available for inspection. I further agree that permission for copying this thesis in any manner, in whole or in part, for scholarly purposes may be granted by my supervisor or, in the absence, by Dean, Faculty of Finance and banking. It is understood that any copying pr publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and Universiti Utara Malaysia for any scholarly use which may be made of any material from my thesis.

Request for permission to copy or to make other use of materials in this thesis, in whole or in part, should be address to:

Dean
Faculty of Finance and Banking
Universiti Utara Malaysia
06010 Sintok
Kedah Darul Aman

## DECLARATION

I hereby declare that this project is my original work except for quotations and citations which I have been duly acknowledged and that it has not been previously or concurrently submitted for any degree or master at Universiti Utara Malaysia or other institutions.

……..
FAZLI BIN ZAINAL ABIDIN
801417

13 MAY 2009

## ACKNOWLEDGEMENT

During the course of this project paper, I have faced many obstacles and difficulties. These problems would have hampered the progress of this project, had it not been for the active support of several individuals. Thus, I owe the successful completion of the project paper to all those who have willingly and relentlessly offered their guidance and assistance.

I would like to extend my heartiest gratitude to Associate Professor Dr. Yusnidah Ibrahim, the supervisor for my project paper for her continuous role in the progress of this project paper. Her direct supervision has enabled me to remain on course without deviating into areas outside the objectives of the study. Besides, I would also like to thank all the finance lecturers. Their kind and encouraging comments are much appreciated.

I would like to also thank my parents, family members and friends for their support. My appreciation also dedicated to my colleagues for their valuable cooperation and opinion towards this project paper. Lastly, I would like to apologize to any part that has been unwittingly left out in this acknowledgement. Your support is much appreciated. Thank you.

**INTERNATIONAL PORTFOLIO DIVERSIFICATION: REALITY OR MYTH**

## ABSTRACT

This study is focused on performance comparison between Malaysian local, regional and global funds in its attempt to investigate whether international portfolio diversification by Malaysian unit trust companies provides better risk return trade-off relative to local portfolio diversification. A sample of 83 funds managed by local fund management companies in Malaysia were selected in this research covering a period time span from 6 April 2007 to 10 April 2009. Analysis of independent sample t-test is used to test whether the risk adjusted returns of global or international funds, as measured by Treynor Index, Sharpe Index and Jensen Alpha, are higher relative to local and regional funds during the period of financial crisis and pre-crisis period. The results of the study show that during recession, global funds and regional funds outperformed domestic funds, meanwhile during normal or pre crisis period, domestic funds outperformed international funds.

## ABSTRAK (BAHASA MALAYSIA)

Kajian ini memfokuskan kepada perbandingan prestasi antara saham amanah tempatan, serantau dan seluruh dunia dalam percubaannya untuk mengenalpasti adakah diversifikasi portfolio antarabangsa oleh syarikat saham amanah Malaysia memberikan ganjaran risiko dan pulangan setanding dengan diversifikasi portfolio tempatan. Sebanyak 83 dana saham amanah yang diurus oleh syarikat unit amanah tempatan telah digunakan sebagai sampel yang meliputi kajian dari tempoh 6 April 2007 hingga 10 April 2009. Analisa ujian t sampel tidak bersandar telah digunakan untuk mengenalpasti adakah ganjaran risiko dan pulangan dari saham amanah seluruh dunia dan serantau yang diukur dengan indek Treynor, Sharpe dan Jensen adalah lebih tinggi berbanding saham amanah tempatan sepanjang tempoh krisis kewangan dan sebelum krisis. Dapatan menunjukan semasa kegawatan, saham amanah dunia dan rantau beprestasi lebih tinggi berbanding saham amanah tempatan, sementara semasa normal atau sebelum krisis, saham amanah tempatan beprestasi lebih baik berbanding saham amanah antarabangsa.

## TABLE OF CONTENTS

**LIST OF TABLES**



**LIST OF APPENDIXES**

# CHAPTER 1

# INTRODUCTION

## 1.0 Introduction

Unit trust fund is one of the most popular investment tools for investors in Malaysia. This is because it does not require knowledge of expertise and time to monitor the investment. Unit trust investment will be monitored by fund management companies and these fund management companies will charge management fees to unit holders annually. With the attractive features of unit trust funds as an investment tools, unit trust in Malaysia have developed rapidly since the nineties. Fund management companies and their unit trust agents aggressively promote their unit trust funds due to the competitive industry. Most of the time fund management companies and their unit trust agents will just enlighten the profit opportunity and the benefits of investing in unit trust. It is very rare to hear anything about the risk associated with the high expectation of returns from unit trust funds. Even the charges were rarely being disclosed by unit trust agents. Investors in Malaysia are not as sophisticated as those investors in developed countries. There are a very small number of investors who even ask about the prospectus. As for the worst part they did not even notice the existence of the said prospectus.

Fund management companies are actually acting as an agent to investors whereby investors provide fund by purchasing units of investment from particular fund while the fund management companies will manage the pool funds to appropriate investment channel according to particular fund investment policy. These unit trust funds will usually consist of a well diversified portfolio where investments can be either in bond, capital market or equity. The main attractive features of unit trust funds is that unit trust is a well diversified portfolio and manage by a professional fund manager.

Unit trust funds can be categorized as either international funds or domestic funds. International funds can be divided into two which are the global fund and regional fund. Global funds are fund which investments are focused globally while regional funds are fund which investments are focused specific part of region internationally. Domestic fund focus its investment domestically which is investment within own country.

**1.1 Background of the issue**

The issue that will be highlighted is whether or not funds who are investing internationally really benefits from the diversification or it is just another product and marketing strategies needs by fund management companies in order to survive in this competitive industry. It is arguable that benefits from international diversification being the sole reason fund management companies participates fund that they manage

in markets globally. A lot of previous studies done since seventies discussing on the benefits of international diversification (e.g. Chiou (2008), Newton et al (2005), Fletcher and Marshall (2005), Bhargava et al (2004), Butler and Joaquin (2002), Meric et al (2001), Bracker and Koch (1999), Shawky et al (1997), Huberman and Kandel (1987), Errunza (1977), Lesard (1973) and Levy and Sarnat (1970)). Results from earlier studies were not supporting each other where there were mixed and conflicting. However, most of recent studies agreed that the benefits of international diversification are decreasing from time to time and there are some who believe the benefits from international diversification do not work when it is needed most (e.g Bracker and Koch (1999), Butler and Joaquin (2001)). This contention appears because they believe the correlation between markets is even higher when U.S market is moving down. Furthermore, investing in international market will add extra risk that does not involve in local market such as, political risk of foreign countries and fluctuation of foreign currencies. As for these reasons this paper will investigate whether or not benefits of diversification still exist and unit trust fund that diversifies their investment in global and regional market really benefits from the diversification.

### 1.2 Problem Statement

Is there any flaw in international diversified portfolio that can be test? Whether the international portfolio risk really reduce and does it offers higher return compared to the domestic diversified investments.

Obviously, fund management companies are a profit oriented organization. As for that reason, fund management companies compete among each other to persuade investors to invest in funds which their company managed. From as low as their unit trust consultant until as high as their fund manager, the motive is to persuade investors to invest in their fund. The higher the fund size approved the higher fund management companies will gain from the management fees. For these reason, it is questionable whether fund management companies in Malaysia are serving investors as a pure fund management companies where they act as an agent who are knowledgeable and capable of managing funds or they just absurdly launch funds with various kinds of policy and name with the sole reason of charging investors with their management fees. As an agent who manages investor's pool money, fund management companies should be responsible for the pooled money and capable of managing funds while charging management fees to investors for the purpose of income.

As what have being enlightened by fund management companies, global and regional fund motive is to diversify the market risk, where it is to invest in few markets which will in return mitigate systematic risk and at the same time maximizing the return. Butler and Joaquin (2002) stressed the importance of stock return correlation in diversification as one of the major concerns when making decision of an investment. It is well being accepted that market all over the world are significantly increasing in correlation and as the market correlation increases the benefits from diversifying internationally or abroad also will decrease.

Previous studies have documented evidences of a significant increase in correlation where most of them agreed that the benefits from international diversification are deteriorating (e.g. Chiou (2008), Shawky et al (1997), Newton et al (2005), Bhargava et al (2004), Meric et al (2001) and Bracker and Koch (1999)). Besides the decreasing in the benefits of diversification, participating in foreign market would expose funds to additional cost and risk. The cost will definitely affect the income distribution on individual basis. If the increase in the cost of investment and additional risk involve is not balanced by additional benefits of diversification, it will not benefit investors.

When one invests in global or regional unit trust fund, one will expect a well diversified investment which in return provides an investment with either higher return or lower risk compared to domestic unit trust Fund. If markets globally are increasingly integrated and correlated, plus additional risk and cost that have to be taken into consideration, international (global and regional) unit trust Fund motive to provide better risk and return is therefore arguable.

### 1.3 Objective of the study

Main objective:

- This study will provide practitioners a reference to identify the effectiveness of international diversification in unit trust in term of better risk and return

trade off. This study also will stand as a reference for investors in choosing their investment portfolio.

- Previous studies done were mostly focused on the comovement of indices, development of portfolios and efficient frontier. We believe the main limitation of previous studies are that they did not take into account the uniqueness of cost and risk associated with international diversification which are likely to offset a large portion of benefits of international diversification. Their results were mostly represented just by examining comovement of indices, developing portfolios and efficient frontier.

- On the other hand, this paper will investigate the benefits of international diversification by examining and comparing returns from Malaysian unit trust itself. Return from global, regional and domestic funds managed by local fund management companies will be investigated. We will examine whether or not the return trend from above mention global, regional and local unit trust differ between each other. By directly examine returns from unit trust funds, we believe we will also cover the unique cost and risk in international diversification.

## 1.4 Research Question

With the conflicting result from previous study of benefits from international diversification, globalization, increase in global market integration and correlation, unavailability of updated research result and unavailability of research on the perspective of Malaysian investors, this study will try to answer the following research question:

1. Are there significant diversification benefits for Malaysian investors in adding either global market or regional market into their portfolios strategy?

2. Does benefits of international diversification in term of risk reduction are declining?

3. Does 'Malaysian international unit trust funds' provide better return compared to 'local funds'?

As fund management companies keep on launching global and regional funds which promises investors better risk and return compared to local funds whereby researcher from U.S and European country documented proves of declining benefits of international diversification since nineties, we believe it is crucial to answer this question.

## 1.5 Contribution of the study

Since previous studies are still lacking with respect to Malaysian unit trust market, this study contribute in terms of measurement to determine Malaysian market scenario. This study would to equip Malaysian investors with the information regarding international diversification benefits as it will provide empirical evidence on comparison between performance of international diversified funds and local diversified funds.

This study strives to determine the existence of benefits from international diversification and it is obvious that it will highlight the importance of investment allocation in portfolio performance. Thus, this study will provide documented prove on comparison of unit trust performance for future reference.

This study result will be different from existing studies because we use unit trust funds as our sample and it is felt that unit trust funds returns already accounted the cost and risk involve in international portfolios. Previous studies reviewed mostly analyzed comovement of index, develops portfolios consist of international indexes and determining efficient frontier which does not take into account the additional cost and risk involved in international portfolios.

## 1.6 Scope and Limitation of the study

For the purpose of comparing return from local unit trust funds and international unit trust fund, this study will cover all equity funds. We decide to use weekly funds NAV during the crisis period which will be gathered from Bloomberg. We believe data available are sufficient and encompassed almost all fund management companies in Malaysia. However, there are limitations that have been identified while completing this study.

This study will only cover funds from Malaysia fund management companies for the period of 2 years from 6 of April 2007 to 10 of April 2009. We believe the data are sufficient in comparing return from unit trust funds. The main reason this study used the data of only for the period of 2 years is because of the limitation in Malaysian funds that invest internationally. It is believe that by just using the data for the period of 2 years we will still be able to investigate at least the effectiveness of international funds before and during crisis.

# CHAPTER 2

# LITERATURE REVIEW

## 2.0 Introduction

The international portfolio diversification occupies an important place in portfolio theory and it is therefore not surprising that it has been widely tested, resulting in a large empirical literature. The majority of the studies have been done using data on developed markets because developed markets are probably more efficient and more competitive financial markets, so they provide a favourable testing ground for the international diversification. However, in this paper we will focus on Malaysia fund management companies.

## 2.1 Theoretical Review

Theory of modern portfolio was first introduced by Harry Markowitz in his paper 'Portfolio Selection' which appeared in the 1952 Journal of Finance. After thirty eight years, he was then shared a Nobel Prize with Merton Miller and William Sharpe for their theories that becomes a broad theory of portfolio selection. Markowitz (1952) in his paper disagreed with how investors during that time allocate

their funds in term of investment in securities. The paper suggests investors to choose portfolio rather than choosing individual securities. Prior to Markowitz (1952) work, investors allocate their investment by accessing risk and reward of securities individually to construct a portfolio whereby Markowitz suggests investors to determine their investment decision by evaluating portfolios on overall risk and return. In a simple word, Markowitz suggests investors to choose portfolios and not a group of securities individually. Markowitz proposed a theory of efficient frontier of portfolios whereby investors should select a portfolio that lies on the efficient frontier.

Markowitz work was then extended by James Tobin (1958) and Sharpe (1964). James Tobin (1958) add the element of risk-free assets to the analysis whereby he believe that this will made it possible to leverage and deleverage portfolio on the efficient frontier and through leverage, portfolios on the capital market line are able to outperform portfolio on the efficient frontier. Sharpe (1964) on the other hand, in his paper of Capital Assets Pricing Model introduce 'beta' representing the systematic risk and specific risk to represent risk of individual securities. Systematic risk is the risk of holding a portfolio in the market, as the market moves each individual securities are more or less will be affected. Sharpe (1964) explained that specific risk in individual securities can be diversified by holding a combination of individual securities as a portfolio thus investors risk exposure will just be the systematic risk of the market portfolio.

With the global market integration and expansion, cross border trading have evolved and becomes as easy as domestic trading. Therefore, diversification benefits within a single market portfolio can be extended by expanding our investment in a few numbers of markets. By participating in few markets rather than only one market our portfolios will be able to diversify the market risk. Furthermore correlation among stocks in different markets are expected to be less that correlation among stocks in the same market, hence based on Markowitz's theory the degree of diversification would be more.

However the benefits of international diversification have been widely debated where the issue of whether or not investors can benefits from diversifying internationally or diversifying internationally just adding in cost without any significant gain or reduction in risk. Shawky et al. (1997) pointed out that financial market are increasingly integrated and might have caused stronger comovements among international equity market thus reducing the potential gain from international diversification. The benefits of international diversification have been a major topic in financial literature as there is no absolute conclusion where the result varies across time and different methods might produces different result. When correlations among indices were used, most of the result agreed with the deteriorating benefits from international diversification (Meric et al (2001), Butler and Joaquin (2001), Bracker and Koch (1999), Bhargava, Konku and Malhorta (2004) and Newton et al (2005)). On the other hand, some of earlier studies suggest that the increase in correlation will not totally eliminate benefits from international diversification and there are benefits

from international diversification (e.g Grubel (1968), Levy and Sarnat (1970), Solnik (1973) and Lessard (1973)).

## 2.2 Empirical Review

Studies on the benefits of international diversification or international portfolios have been conducted by researchers in many other countries all over the world, especially in the U.S and U.K. However, most of those studies reflect the researcher own country as the study sample. Hence, the benefits from international diversification investigated in previous research were mostly on the perspective of U.S and European investors (e.g. Fletcher and Marshall (2005), Butler and Joaquin (2002), Butler and Joaquin (2001),Meric et al (2001), Bracker and Koch (1999), Newton et al. (2005), and Shawky et al. (1997)). The only research we reviewed where the study investigated benefits of diversification on the perspective of emerging market or specifically East-Asia was the paper by Chiou (2008). In addition to limitation of previous studies in respect to Malaysia, it is also noted that the methods they used did not take into account the uniqueness of cost and risk involved in international portfolios.

A lot of previous studies documented empirical proves on the said benefits of international diversification. One of recent studies was by Meric et al (2001) where they investigate the changes in correlation between four largest Latin American markets, from the point of view of US investors. It is found that there is no significant

gain from a well diversified portfolio of Latin stocks. They also documented a significant increase in correlation between the said four Latin market and US domestic market. The result of significant increase in correlation suggests deteriorating benefits of diversification.

Shawky et al. (1997) on the other hand found that market correlation was not stable and it is very difficult for investors to select an optimal investment strategy ex-ante, but when ex-post data is examined, benefits of diversification can be detected. As the correlation between markets was not stable, findings from this study suggest a doubtful benefit of international diversification since it is very hard to determine investment decision ex-ante. An explanation to the finding is that financial markets are increasingly integrated and might have caused stronger comovements among international equity market.

The famous contentions that market are more correlated when U.S market is moving down called for the needs of providing prove statistically. For this reason, Butler and Joaquin (2001) separate the sample periods into three which are the bear, calm and bull. Butler and Joaquin study which focus on market correlation during bear, calm and bull market documented prove of a higher-than-normal correlation during extreme market downturn. This result suggest international diversification fail to provide the benefits of lowering risk or a better return just when they are needed most. An earlier study by Bracker and Koch (1999) on economic determinant of correlation structure across international equity market also documented the same

result where they also suggest that international diversification fail to work when it is needed the most.

With the intention to revisits the issue of global diversification in order to determine the existence of benefits from international diversification as markets are becoming increasingly integrated, Bhargava, Konku and Malhorta (2004) analyzed 22 years (1978- 2000) return of four indexes which are Standard & Poor's composite 500 (S&P 500), Morgan Stanley Capital International (MSCI) World Index; Europe, Australia and Far East Index (EAFE) and the MSCI Europe Index. Their research suggests that international markets are increasingly integrated and doubt the benefits of international diversification. Findings from their research were still positive where their major findings suggest the present of benefits from international diversification. However, their study also documented a reduction of risk level when the whole period and four indices are included as one portfolio. However, the study agrees that the benefits of international diversification are steadily decreasing when they analyzed the correlation from period of the last 10 years.

Meanwhile, Fletcher Marshall (2005) examines the benefits of international portfolio diversification for UK investors between January 1985 and December 2000. Their research uses three sets of international assets which are global industry portfolio, country equity portfolio and investment sector portfolio of unit trusts and was focused on develop market. This study conveys a positive result where there is a significant diversification benefits for a UK investors in developed equity market.

Similar study was executed by Newton et al (2005). Their research was also on stock market comovement and in the study they include both developed and emerging market. They divide the stock market indices into 2 subsets of data which results a practically stable correlation of developed market across the two decades. However, there is a trend of increasing correlation suggesting the benefits from international diversification into stock market have decreased. They also pointed out that the correlation between markets almost triples to 0.27 in the nineties, up from 0.1 in the eighties.

Chiou (2008) study suggests that local investors from the less developed country will enjoy higher benefits of international diversification than those in developed countries. This is because investors in emerging market obtain significant superiority in a growth of risk premium and reduction in volatility. Chiou also pointed out that benefits of international diversification have reduced overtime following financial crisis and as the international market are becoming more integrated. The study used Markowitz (1952) to form a global efficient frontier and data used was MSCI indices for 21 Developed countries and 13 developing countries. Performances of portfolios were compared using the risk adjusted return and the benefits of diversification were evaluated using mean-variance efficiency. Chiou paper which investigates the relative magnitude of the international diversification benefits for the domestic investors in various countries found that Japan, Philippines, Thailand, New Zealand, Portugal, Indonesia and Korea are countries that gained highest benefits from global diversification.

## 2.3 Studies on Unit Trust in the Local Industry

While looking into the benefits of diversifying internationally by using Unit Trust Funds as variables, it is felt very unfair if we left studies on local unit trust industry without reviewing them. Studies on Unit trust funds in Malaysia have been done since Chua (1985). Among others, the most cited studies was by Ewe (1994), Shamser and Anuar (1995), Annuar et al (1997), Leong and Aw (1997), Tan (1995), Ong (2000), Taib et al (2000), Shamsher et al (2000), Fauziah et al (2002), Chong and Kho (2002), Noor Azlan Ghazali (2005) and Low (2005). Parallel with the expansion of local Unit Trust industry, studies by academician are also growing in numbers.

Soo-Wah and Noor Azlan (2007) examined the price linkage of Malaysian Unit Trust and the KLCI through the use of cointegration analysis to find the long run relationship and granger causality test to find the short run price linkages. . Their result suggests that in the long run, unit trust funds performance can diverge significantly from KLCI. Shockingly, even index funds trend also differ from the KLCI. On the other hand, in the short run unit trust funds prices are related to KLCI.

Fikriyah et al (2007) compare the performance between Malaysian Islamic Unit Trust Funds and Conventional Unit Trust Funds. In their paper they used Sharpe index, adjusted Sharpe index, and timing and Selectivity ability to examine the return from both Islamic and Conventional funds. They further clustered their study period

into pre-crisis, during crisis and post crisis period. The conventional funds also were divided into two categories which is the governmental funds and the non-governmental funds. Their result reveals that Islamic funds perform better during bearish market while Conventional funds were better during bullish market. This result suggested that having Islamic funds help to hedge one investment portfolio during bearish market.

Meanwhile, Fauziah and Mansor (2007) examine performance of unit trust funds covering full economic cycles in Malaysia for the period of 1991 to 2001. The result however was not encouraging to Malaysian Unit trust industry where it is evidenced that average Malaysian unit trust performance falls below market portfolio and risk free rate. The results are both from raw return and market adjusted return. On the other hand the variance of unit trust funds is below market variance during crisis period. Their result also reveals that bond fund returns is above market return and equity fund return.

Nik Maheran and Masliza (2008) extend the study by Annuar, Shamsher and Ngu (1997) and Fikriah et al. (2007) on Islamic Unit trust funds. Using Sharpe and Treynor index to examine the performance of Islamic equity funds in Malaysia, they documented a consistent result with previous study (e.g Ewe (1994), Shamser and Anuar (1995), Abdullah et al (2000)) where all funds included in their study sample except Public Ittikal Fund achieved lower return compared to KLCI. Their correlation

test on the other hand found that funds performance is significantly correlated with the stock market index.

Conflicting argument between academician research result and report by the industry players motivated Fauziah, Sobri and Joriah (2008) to study which is a better unit trust strategy: Follow the Winner or Buy and Hold'. As what being commonly used in comparing return, their study also used raw return, Sharpe index and Treynor index. Their findings suggest that using the strategy of investing in funds that have the record of winning the Edge-Lipper award will be very helpful for investors who are investing in conventional unit trust funds.

# CHAPTER 3

# METHODOLOGY

## 3.1 Introduction

This study will be mainly focused on the selected number of Malaysian Base Unit Trust Fund and it will test whether diversifying in global and regional fund still offers the benefit of lowering the risk and at the same time maintaining or increasing the return compared to local fund.

This chapter will present the research methodology adopted to achieve the objectives of the study. The section 3.2 discusses the data and sample selection. Section 3.3 presents the data analysis method which includes the measurement of variables, the hypotheses to be tested and the analysis method used.

## 3.2 Data and Sample Selection

### 3.2.1 Sample Selection

In the attempt to examine the existence of benefits from international diversification offered by international unit trust funds managed by Malaysian fund

management companies, this study will look into all equity unit trust funds managed by local fund management companies. The sample that consists of Malaysian unit trust funds will be divided into 3 categories which are global funds (funds that invest in stock market worldwide), regional funds (funds which investment focuses on Asian region or particular country in Asia) and local funds (funds which investment is focused domestically).

Data consists of Net Asset Value (NAV) of the sampled unit trust funds with complete data for the entire period of study over 2 years up to April, 2009. Surprising, while the data gathering been conducted, it is found that Malaysia do have data of domestic funds return of more than 10 years. However data of return for international and regional funds available for comparison purpose was only for 2 years. There are few international funds (3-5) that have the return data of 3 years, however for comparison purposes we have to synchronise and choose to the data of 2 years. The reason behind this situation is not that the Bloomberg database does not keep the data of international funds return but international funds in Malaysia it self are new and most of them are only for 2 years plus. Fund included in the study consist a total of 83 funds which are clustered into 50 local funds, 17 regional funds and 16 global funds. The sample will be further divided into 3 sub-sample of before the recent global financial crisis (April 2007 to January 2008), during the crisis (July 2008 to April 2009) and the whole data period of both before and during the crisis (April 2007 to April 2009). The date that was used as the beginning of the crisis in this study is a few months later than the actual outbreak of the subprime crisis in the US because

during that period Malaysia have yet to fell the full blown of the crisis. Indeed KLCI went up above 1500 points in January 2008 despite the fact that US already been hit by the subprime crisis.

### 3.2.2 Sources of Data

The main sources of data for this study are from the Bloomberg database and Yahoo finance. Bloomberg database provides NAV's for all unit trust funds managed by Malaysian fund management companies while 'http://finance.yahoo.com/' is the website where data for market indices was collected. In classifying unit trust funds according to different categories www.invest.com.my/personal was referred to. This website provides various kind of information regarding unit trust including their objectives and categories.

## 3.3 Data Analysis

### 3.3.1 Return Measurement

Return from unit trust funds came from 2 main sources namely the distribution of income and/or dividend and asset value appreciation. Hence, the total return from each fund can be calculated using the following formula:

$$R_t = \frac{NAV_t + D_t - NAV_{t-1}}{NAV_{t-1}}$$

Where $NAV_t$ is the ending weekly net asset value, $NAV_{t-1}$ is the beginning weekly net asset value and $D_t$ is the income and capital gain distributions of the fund or dividend distributed. The average weekly return was then calculated using this formula:

$$\overline{R}_p = \frac{1}{n}\sum_{i=1}^{n} R_{pt}$$

### 3.3.2 Risk- Adjusted Returns Measurement

Funds performance will be compared using the standard methods in comparing returns namely the Treynor's Index, Sharpe's Index and Jensen Index. Treynor's Index is the first risk-adjusted performance measurement tool which was introduced by Treynor in his paper in 1965. Treynor paper was then extended by Sharpe (1966) who suggests to use standard deviation rather than beta as the denominator or risk measurement. Both Treynor's and Sharpe's Index measure the return earned per unit of risk, the only different in both measurement is that Treynor's Index used beta as the denominator while Sharpe's Index used standard deviation. Beta is the measurement of systematic risk of each fund while standard deviation is a measure of how widely return values are dispersed from the average return value (the mean). On the other hand, the Jensen Index is a model that was developed by Jensen

(1968). In the model alpha represents the average incremental rate of return on the portfolio per unit of time. Formula for Treynor's, Sharpe's and Jensen are as follows:

**Treynor's Index:**

$$\frac{R_p - R_f}{\beta},$$

**Sharpe Index:**

$$\frac{R_p - R_f}{\sigma_p} \text{ and,}$$

**Jensen Index:**

$$\alpha = (R_p - R_f) - \beta (R_m - R_f) + \varepsilon$$

Where,

$R_p$ is the average weekly return of each fund,

$R_f$ is the risk free rate (3 month Malaysia T-bill),

$R_m$ is the average weekly market return,

$\beta$ is the systematic risk for each fund and,

$\sigma_p$ is the standard deviation of weekly return for each fund.

Beta for each fund was calculated using the slope of weekly return linear regression line between the KLCI benchmark (on the X axis) and fund (on the Y axis) where the equation is as follow:

$$\beta = \frac{\sum (x-\bar{x})(y-\bar{y})}{\sum (x-\bar{x})^2}$$

The standard deviation is one of common method in measuring risk and the formula is as follow:

$$\sigma = \frac{\sum (x-\bar{x})^2}{(n-1)}$$

Meanwhile, the risk free rate for our study is taken from the rate of Malaysian 3 month T-bills dated April 10, 2009 which is 1.93%. The annualised rate is used to compute the weekly equivalent return using the following equation by Redman et al. (2000):

$$1 + R_{wf} = (1 + \mathbf{y})^{\frac{1}{52}}.$$

Where

$R_{wf}$ is the weekly equivalent risk-free return

Y is the effective annual yield on 3-month Treasuary Bill.

### 3.3.3 Hypothesis Development

The main question in this study is whether or not international diversification in both global and regional fund offered in Malaysia really benefits the investing public. As such, following hypothesis has been created:

**Hypothesis 1** Global unit trust funds provide better Risk-reward profile compared to domestic unit trust funds

**Hypothesis 2** Regional unit trust funds provide better Risk-reward profile compared to domestic unit trust funds

The stability of the relationship is examined by testing the hypotheses for different sub period and was compared.

### 3.3.4 Analysis of Findings

Descriptive data analysis of the returns were performed followed by hypothesis testing using independent-sample t- test.

# CHAPTER 4

# ANALISIS OF FINDINGS

## 4.1 Introduction

In the first part of this chapter, an overview regarding unit trust performance in different period of study and fund categories which are local funds, global funds and regional funds during the period of before crisis, during crisis and the whole study period is presented. Results from the categorization fund performance analysis are presented in Table 4.1, 4.2 and 4.3. These tables presents Sharpe's, Treynor and Jensen index for each category of fund. Subsequently, a more formal test known as Independent sample T-test is adopted to support our general findings in the first part.

Our focus in this chapter is on the results of the t-test on Sharpe's, Treynor's and Jensen index for each category of fund. Consequently, we derive our conclusion whether international portfolio diversification is a reality or myth based on our study sample.

## 4.2 Descriptive Analysis

The Sharpe Index, Treynor Index and Jensen Index for each funds included in this study are computed and presented in Table 4.1 – 4.3.

**Table 4.1: Local Unit Trust Performance**

| Funds | Sharpe Index | | | Treynor Index | | | Jensen Index | | |
|---|---|---|---|---|---|---|---|---|---|
| | 4/07-6/08 | 7/08-4/09 | 4/07-04/09 | 4/07-6/08 | 7/08-4/09 | 4/07-04/09 | 4/07-6/08 | 7/08-4/09 | 4/07-04/09 |
| PUBPBIE | -0.03117 | -0.35317 | -0.1465 | -0.00109 | -0.01174 | -0.00505 | -0.00114 | -0.00436 | -0.00215 |
| PUBISOP | 0.03669 | -0.3419 | -0.10307 | 0.001534 | -0.01408 | -0.00428 | 0.00121 | -0.00454 | -0.00097 |
| PUBISEF | -0.06403 | -0.3118 | -0.14413 | -0.00237 | -0.00952 | -0.00507 | -0.00191 | -0.00184 | -0.00162 |
| PACPREM | -0.00156 | -0.30281 | -0.13351 | -4.9E-05 | -0.00985 | -0.00423 | -4.5E-06 | -0.00259 | -0.00111 |
| PACDIVF | 0.03205 | -0.32139 | -0.10811 | 0.001098 | -0.01047 | -0.00363 | 0.000808 | -0.00246 | -0.00049 |
| KUTEQIS | 0.059072 | -0.29968 | -0.04524 | 0.00177 | -0.00934 | -0.00142 | 0.001355 | -0.00104 | 0.000905 |
| HLBMAKM | -0.03796 | -0.27924 | -0.13522 | -0.00117 | -0.01012 | -0.00445 | -0.00096 | -0.00221 | -0.00117 |
| BHLPDA2 | 0.071627 | -0.29785 | -0.0949 | 0.002137 | -0.01077 | -0.00308 | 0.002219 | -0.00375 | -0.00016 |
| RHBDYFI | -0.00113 | -0.35647 | -0.13119 | -3.1E-05 | -0.01232 | -0.00393 | 1.15E-05 | -0.00336 | -0.00082 |
| RHBDIVA | -0.09606 | -0.25642 | -0.15396 | -0.00556 | -0.00921 | -0.00735 | -0.00429 | -0.00237 | -0.00378 |
| RHBISGR | 0.0424 | -0.38445 | -0.09414 | 0.001185 | -0.01515 | -0.00296 | 0.001302 | -0.00408 | -3.6E-05 |
| BHLPDA1 | 0.0612 | -0.3155 | -0.07848 | 0.00175 | -0.01035 | -0.00237 | 0.001775 | -0.00248 | 0.000475 |
| PHIFETF | -0.2659 | -0.22511 | -0.24982 | -0.01263 | -0.00692 | -0.01019 | -0.00815 | -0.00013 | -0.00498 |
| OSKTRAK | 0.011983 | -0.23631 | -0.09338 | 0.000324 | -0.00634 | -0.00252 | 0.00036 | 0.000398 | 0.000387 |
| OSKTREA | -0.00546 | -0.3839 | -0.12439 | -0.00017 | -0.01772 | -0.00432 | -0.00013 | -0.00497 | -0.00115 |
| RHBCPFI | 0.007804 | -0.37733 | -0.13996 | 0.000214 | -0.01421 | -0.00431 | 0.000242 | -0.00433 | -0.0011 |
| MAAEIFI | 0.048611 | -0.24132 | -0.05864 | 0.001678 | -0.00692 | -0.00189 | 0.001591 | -0.00015 | 0.000931 |
| MAAGROW | 0.051301 | -0.2238 | -0.05176 | 0.00156 | -0.00782 | -0.00166 | 0.001504 | -0.0007 | 0.001032 |
| MAAVALF | 0.041215 | -0.34046 | -0.10491 | 0.001229 | -0.01215 | -0.00335 | 0.001162 | -0.00347 | -0.00035 |
| PHIEQGF | -0.01098 | -0.34168 | -0.14098 | -0.00035 | -0.01178 | -0.00461 | -0.00022 | -0.0029 | -0.00112 |
| INGSSCM | 0.048979 | -0.29981 | -0.09129 | 0.001439 | -0.00857 | -0.00266 | 0.001441 | -0.00165 | 0.000245 |
| KUTENF | 0.053282 | -0.03805 | -0.00616 | 0.001562 | -0.00241 | -0.00031 | 0.001262 | 0.004029 | 0.002196 |
| MAADVDF | -0.04811 | -0.21812 | -0.11138 | -0.00166 | -0.00666 | -0.0037 | -0.00089 | 4.57E-05 | -0.00041 |
| MAAEQ80 | -0.01224 | -0.20704 | -0.10225 | -0.00035 | -0.00669 | -0.00311 | -0.0003 | 6.47E-05 | -0.00019 |
| AMISGR | 0.042704 | -0.36096 | -0.02309 | 0.002955 | -0.01035 | -0.00143 | 0.002563 | -0.00203 | 0.001097 |
| ABMLTII | 0.016433 | -0.28004 | -0.04478 | 0.00099 | -0.0088 | -0.00242 | 0.000823 | -0.00117 | 0.000348 |
| AMNEWFR | 0.092835 | -0.32409 | -0.07245 | 0.002675 | -0.00923 | -0.00209 | 0.002229 | -0.00182 | 0.000657 |
| INGBLUE | -0.08577 | -0.28475 | -0.11802 | -0.00395 | -0.00805 | -0.00526 | -0.00438 | -0.00086 | -0.00214 |
| SBBEQIF | 0.034713 | -0.3009 | -0.11645 | 0.001038 | -0.00926 | -0.00354 | 0.001119 | -0.00281 | -0.00067 |
| BHLINDX | 0.013249 | -0.23543 | -0.09169 | 0.000358 | -0.00633 | -0.00248 | 0.0004 | 0.000411 | 0.000434 |
| HLBGROI | 0.000799 | -0.30467 | -0.11418 | 2.35E-05 | -0.01162 | -0.00369 | 6.06E-05 | -0.00279 | -0.0006 |
| KLRSFDI | -0.04603 | -0.31487 | -0.13953 | -0.00168 | -0.00972 | -0.00483 | -0.00149 | -0.00234 | -0.00165 |
| COMFGLI | 0.009506 | -0.33455 | -0.12687 | 0.000266 | -0.00926 | -0.00355 | 0.000306 | -0.00224 | -0.0006 |
| BHLBHGI | 0.010817 | -0.26267 | -0.0977 | 0.000302 | -0.00722 | -0.00272 | 0.000369 | -0.00045 | 0.0002 |
| SBBPRCI | 0.065252 | -0.32027 | -0.09162 | 0.002071 | -0.0096 | -0.00284 | 0.001841 | -0.00243 | 6.39E-05 |
| SBBCEQF | 0.052496 | -0.32053 | -0.10917 | 0.001587 | -0.00995 | -0.00334 | 0.001733 | -0.00343 | -0.00046 |
| ASMFPFI | -0.0701 | -0.28359 | -0.14064 | -0.00253 | -0.00844 | -0.00482 | -0.00161 | -0.00091 | -0.00114 |
| ASMAINI | -0.09769 | -0.27977 | -0.17843 | -0.00357 | -0.00826 | -0.00591 | -0.00217 | -0.00122 | -0.00209 |
| ASMARBI | -0.015 | -0.24819 | -0.11973 | -0.00046 | -0.00735 | -0.00363 | -0.0003 | -0.00049 | -0.00055 |
| SBBSEQY | 0.02182 | -0.39909 | -0.14158 | 0.000655 | -0.01328 | -0.00443 | 0.000756 | -0.00552 | -0.00151 |
| ABMLCUI | 0.005694 | -0.33783 | -0.11563 | 0.000174 | -0.01017 | -0.00354 | 0.000218 | -0.00259 | -0.00056 |
| AMDIVIN | 0.039154 | -0.23288 | -0.07873 | 0.001117 | -0.00667 | -0.00225 | 0.000827 | 5.95E-05 | 0.000479 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| APXTRAK | 0.018675 | -0.22135 | -0.08633 | 0.000531 | -0.0076 | -0.00266 | 0.000345 | -0.00044 | 0.000148 |
| JFAMGRI | -0.13014 | -0.30357 | -0.18234 | -0.00413 | -0.00867 | -0.00574 | -0.00312 | -0.00103 | -0.00186 |
| KLAGGFI | -0.0021 | -0.31215 | -0.11657 | -7.6E-05 | -0.0102 | -0.00406 | -3.7E-05 | -0.00339 | -0.00122 |
| AFFEQYF | -0.12547 | -0.20871 | -0.15351 | -0.0047 | -0.00677 | -0.00557 | -0.00421 | -1.3E-05 | -0.0022 |
| ALLOPTI | -0.11612 | -0.30466 | -0.19893 | -0.00626 | -0.01231 | -0.00931 | -0.00206 | -0.00257 | -0.00249 |
| ALLTACG | 0.041508 | -0.06272 | -0.02673 | 0.001239 | 0.013384 | -0.00395 | 0.001005 | -0.00643 | -0.00033 |
| HIJASWI | -0.04384 | -0.21583 | -0.10227 | -0.00128 | -0.00646 | -0.00306 | -0.00095 | 0.00015 | -9.1E-05 |
| PUBPBGF | 0.055799 | -0.29523 | 0.011551 | 0.200235 | -0.00939 | 0.003153 | 0.007991 | -0.00216 | 0.002434 |
| **Mean** | **-0.00438** | **-0.28606** | **-0.10838** | **0.003593** | **-0.00905** | **-0.00369** | **1.03E-05** | **-0.00195** | **-0.00059** |

Table 4.1 presents performance of local unit trust funds using Sharpe's index, Jensen index and Treynor's index. The result presented divides performance measurement into 3 sub-periods, April 2007 to June 2008, July 2008 to April 2009 and the whole study period from April 2007 to April 2009. Only Treynor's index and Jensen index on April 2007 to June 2008 shows a positive mean with Treynor's 0.003593 and Jensen 0.000103.

Table 4.2 illustrates regional unit trust funds performances. With the total of 17 regional funds in the study sample, performances were negative on every measurement methods used. Using Sharpe's, Jensen and Treynor's index, the mean performances were better before crisis compared to during the crisis. Unfortunately, results were all negative.

Looking at the mean Sharpe's, Jensen and Treynor's, International unit trust funds performance is the worst compared to regional and local funds. Based on the result presented on Table 4.3, positive results were only on 1: PRUGLOL using Treynor's and Jensen index during the period before crisis. 2: HWAGLEM an all 3 measurement methods where positive result conveyed on using both Sharpe and

Treynor before crisis and the whole study period, while positive result using Jensen for both before crisis and during crisis.

**Table 4.2: Regional Unit Trust Performance**

| Funds | Sharpe Index | | | Treynor Index | | | Jensen Index | | |
|---|---|---|---|---|---|---|---|---|---|
| | 4/07-6/08 | 7/08-4/09 | 4/07-04/09 | 4/07-6/08 | 7/08-4/09 | 4/07-04/09 | 4/07-6/08 | 7/08-4/09 | 4/07-04/09 |
| PHASEJI | -0.02375 | -0.29227 | -0.16664 | -0.00082 | -0.01093 | -0.00621 | -0.00049 | -0.00408 | -0.00258 |
| CIMAPAD | 0.01919 | -0.11493 | -0.05300 | 0.00074 | -0.00694 | -0.00260 | 0.00063 | -0.00015 | 0.00026 |
| PBISASE | -0.04174 | -0.26586 | -0.09130 | 0.00133 | -0.00944 | -0.00304 | 0.00140 | -0.00251 | -0.00012 |
| PHASEJP | -0.05960 | -0.26893 | -0.16858 | -0.00208 | -0.01040 | -0.00637 | -0.00149 | -0.00390 | -0.00305 |
| PRUAPEF | -0.09651 | -0.18439 | -0.14096 | -0.00456 | -0.00672 | -0.00591 | -0.00244 | 0.00003 | -0.00235 |
| RHBDIVA | -0.09606 | -0.25642 | -0.15396 | -0.00556 | -0.00921 | -0.00735 | -0.00429 | -0.00237 | -0.00378 |
| TASOUTH | -0.02651 | -0.24239 | -0.11863 | -0.00097 | -0.00765 | -0.00406 | -0.00102 | -0.00114 | -0.00134 |
| HLGGLHL | -0.13403 | -0.06501 | -0.07750 | -0.01127 | -0.00577 | -0.00767 | -0.00203 | 0.00049 | -0.00148 |
| HLGAPDV | -0.05396 | -0.26662 | -0.15984 | -0.00232 | -0.01068 | -0.00669 | -0.00157 | -0.00405 | -0.00317 |
| MAAPACF | -0.05456 | -0.19842 | -0.12320 | -0.00210 | -0.00732 | -0.00467 | -0.00172 | -0.00061 | -0.00164 |
| SBBAEQF | 0.02904 | -0.08114 | -0.01206 | 0.00277 | -0.00963 | -0.00123 | 0.00273 | -0.00179 | 0.00140 |
| OSKAPAC | 0.01586 | -0.30844 | -0.04443 | 0.00444 | -0.01222 | -0.00602 | 0.00185 | -0.00531 | -0.00208 |
| AMMAPPRO | -0.08618 | -0.13562 | -0.11048 | -0.00409 | -0.00718 | -0.00578 | -0.00323 | -0.00053 | -0.00280 |
| PBISASE | -0.04174 | -0.26586 | -0.09130 | 0.00133 | -0.00944 | -0.00304 | 0.00140 | -0.00251 | -0.00012 |
| PUBFESL | 0.00577 | -0.18808 | -0.07928 | 0.00033 | -0.00731 | -0.00374 | 0.00029 | -0.00066 | -0.00078 |
| CIMBHID | 0.00279 | -0.19236 | -0.09697 | 0.00010 | -0.00673 | -0.00347 | 0.00012 | 0.00003 | -0.00057 |
| PUBASIT | -0.03252 | -0.19506 | -0.09920 | -0.00112 | -0.00690 | -0.00346 | -0.00090 | -0.00011 | -0.00044 |
| **Mean** | **-0.02985** | **-0.20716** | **-0.10514** | **-0.00140** | **-0.00850** | **-0.00478** | **-0.00063** | **-0.00172** | **-0.00145** |

**Table 4.3: Global Unit Trust Funds Performance**

| Funds | Sharpe Index | | | Treynor Index | | | Jensen Index | | |
|---|---|---|---|---|---|---|---|---|---|
| | 4/07-6/08 | 7/08-4/09 | 4/07-04/09 | 4/07-6/08 | 7/08-4/09 | 4/07-04/09 | 4/07-6/08 | 7/08-4/09 | 4/07-04/09 |
| PRUGLOL | -0.00003 | -0.18824 | -0.09207 | 0.00000 | -0.00956 | -0.00656 | 0.00002 | -0.00338 | -0.00274 |
| PUBGLOS | -0.07552 | -0.23305 | -0.15569 | -0.00296 | -0.00912 | -0.00621 | -0.00151 | -0.00185 | -0.00208 |
| RHBGLTH | -0.08624 | -0.22376 | -0.15972 | -0.00454 | -0.01042 | -0.00829 | -0.00189 | -0.00387 | -0.00376 |
| AMOAGIS | -0.06988 | -0.21321 | -0.14879 | -0.00446 | -0.01041 | -0.00872 | -0.00100 | -0.00312 | -0.00292 |
| INGGLDD | -0.12675 | -0.23377 | -0.17976 | -0.00692 | -0.01329 | -0.01069 | -0.00249 | -0.00505 | -0.00424 |
| OSKGEYF | -0.16516 | 0.01989 | -0.00264 | -0.01157 | 0.00303 | -0.00049 | -0.00346 | 0.01243 | 0.00166 |
| OSKSTAR | -0.10107 | -0.40995 | -0.22778 | -0.00390 | -0.01540 | -0.00865 | -0.00311 | -0.00677 | -0.00462 |
| PASTARS | -0.04986 | -0.20601 | -0.13686 | -0.00365 | -0.01144 | -0.00886 | -0.00080 | -0.00307 | -0.00247 |
| HGLOPRO | -0.00286 | -0.22811 | -0.06758 | -0.00048 | -0.01640 | -0.00819 | -0.00031 | -0.00900 | -0.00434 |
| HWAGLOP | -0.00842 | -0.25335 | -0.12950 | -0.00037 | -0.01289 | -0.00610 | -0.00024 | -0.00517 | -0.00251 |
| SBBGLGR | -0.03411 | -0.18655 | -0.10820 | -0.00305 | -0.00967 | -0.00713 | -0.00126 | -0.00271 | -0.00270 |
| CIMTTAN | -0.01489 | -0.21587 | -0.08176 | 0.03536 | -0.01001 | -0.01154 | -0.00058 | -0.00186 | -0.00208 |
| AMPEUPR | -0.07255 | -0.28739 | -0.14366 | -0.15920 | -0.01447 | -0.02020 | -0.00550 | -0.00800 | -0.00819 |
| AMSCEUR | -0.03648 | -0.23913 | -0.14980 | -0.00211 | -0.01069 | -0.00775 | -0.00085 | -0.00441 | -0.00351 |
| HWAGLEM | 0.09437 | -0.09293 | 0.00920 | 0.00386 | -0.00413 | 0.00039 | 0.00251 | 0.00172 | 0.00215 |
| AMGLPEQ | -0.18122 | -0.16628 | -0.14987 | -0.01442 | -0.00905 | -0.01023 | -0.00477 | -0.00350 | -0.00618 |
| **Mean** | **-0.05817** | **-0.20986** | **-0.12028** | **-0.01115** | **-0.01024** | **-0.00808** | **-0.00158** | **-0.00298** | **-0.00303** |

## 4.3 Comparison of Unit Trust Performance

### Overall period of study

Table 4.4 summarises the average Sharpe Index, Treynor Index and Jensen Index for the three categories of funds for the overall period of study.

**Table 4.4: Unit Trust Performance (April 2007 – April 2009)**

| Unit Trust | Number of Funds | Sharpe Index | Treynor Index | Jensen Index |
|---|---|---|---|---|
| Domestic | 50 | -0.1083761 | -0.0036892 | -0.000595 |
| Regional | 17 | -0.1051376 | -0.0047818 | -0.001449 |
| International | 16 | -0.1202802 | -0.0080764 | -0.003032 |
| Market Index | KLCI | -0.108172 | -0.0029176 | 0.000000 |

Independent t-tests were executed to compare the funds' performance during the period and the result is given in Table 4.5

**Table 4.5: T-test Results on Unit Trust Performance (April 2007 – April 2009)**

| Paired Sample | Sharpe Index t- stat (p-value) | Treynor Index t- stat (p-value) | Jensen Index t- stat (p-value) |
|---|---|---|---|
| Domestic and International | -0.246 (0.807) | 5.376*** (0.000) | 2.252** (0.028) |
| Domestic and Regional | 0.808 (0.422) | 01.945** (0.056) | 5.043*** (0.00) |
| Regional and International | 0.811 (0.424) | 2.748** (0.01) | 2.248** (0.032) |

Table 4.4 and table 4.5 present result from independent T-test of Sharpe, Treynor and Jensen index for the whole study period of April 2007 to April 2009. Sharpe index suggests local and international funds underperform market benchmark consistent with the result of local unit trust studies by Ewe (1994), Shamser and Anuar (1995), Abdullah et al (2000), Fauziah and Mansor (2007) and Nik Maheran

and Masliza (2008) . Meanwhile, the mean of regional funds Sharpe index was slightly higher than KLCI. Based on Sharpe index, regional funds perform the best for the whole study period. However, the result is not significant. Result from Treynor's index on the other hand suggests International funds underperform both local and regional fund with 1% significant level on comparison between local-international funds and 5% significant level on the comparison between regional-international funds. With 1% significant level, result from Jensen index suggest local funds performed better compared to regional funds. Global funds also underperformed the performance of local funds with 5% significant level. As for comparison between regional and global funds, regional funds give higher returns at 5% significant level.

**During the Normal Period**

As shown in Table 4.6, the period before recession also was not encouraging where local, regional and global unit trust funds in our study sample underperformed KLCI return based on the measurement of Sharpe' Index. Treynor's index on the other hand, shows that the mean of local funds outperformed market benchmark. Meanwhile both regional and global funds underperformed the KLCI mean.

**Table 4.6: Unit Trust Performance (April 2007 – June 2008)**

| Unit Trust | Number of Funds | Sharpe Index | Treynor Index | Jensen Index |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Domestic | 50 | -0.0043837 | 0.0035926 | 0.0000103 |
| Regional | 17 | -0.0298543 | -0.0014041 | -0.000633 |
| International | 16 | -0.0581669 | -0.0111512 | -0.001578 |
| Market Index | KLCI | -0.00159727 | -0.0000431 | 0.000000 |

**Table 4.7: T-test Results on Unit Trust Performance (April 2007 – June 2008)**

| Paired Sample | Sharpe Index t- stat (p-value) | Treynor Index t- stat (p-value) | Jensen Index t- stat (p-value) |
|---|---|---|---|
| Domestic and Regional | 1.431 (0.157) | 0.717 (0.476) | 1.032 (0.306) |
| Domestic and International | 2.805*** (0.007) | 1.612 (0.112) | 2.469** (0.016) |
| Regional and International | 1.333 (0.192) | 0.979 (0.335) | 1.411 (0.168) |

A significant difference in Sharpe index was found on comparison between local and global funds with 1% significant level where local funds outperformed global fund. Jensen index also shows a significant result in comparison between local and global funds at 5 % significant level where local funds again outperformed global fund. The result from comparison of local–regional and regional-international shows that there is no significant different between the Treynor index of all the three categories of fund and there is also no different between the Sharpe Index and Jensen Index of domestic funds and those of regional funds, and between Sharpe Index and Jensen Index of regional funds and global funds.

**During the Recession Period**

July 2008 to April 2009 is the period we assume KLCI to be in the recession period. During this period of study, using standard deviation of fund return for our risk measurement, mean for both regional and global fund exceeded both mean for KLCI benchmark and local fund. Table 4.8 presents the means for all the performance measures of each type of funds.

Based on Jensen Index and Treynor index, regional funds performance is the best compared to local and global funds but Sharpe Index shows that it performed the worst during the period of recession. However, independent sample t- test indicates that only the different based on Sharpe index is significant. Hence it is concluded that during the period of recession, based on Sharpe Index, both global fund and regional funds outperformed local funds.

**Table 4.8: Unit Trust Performance (July 2008 – April 2009)**

| Unit Trust | Number of Funds | Sharpe Index | Treynor Index | Jensen Index |
|---|---|---|---|---|
| Domestic | 50 | -0.2860580 | -0.0090537 | -0.001947 |
| Regional | 17 | -0.2071641 | -0.0084969 | -0.001716 |
| International | 16 | -0.2100000 | -0.0102442 | -0.002976 |
| Market Index | KLCI | -0.2519914 | -0.0067503 | 0.000000 |

| | | | | |
|---|---|---|---|---|
| | | | | |

**Table 4.9: T-test Results on Unit Trust Performance (July 2008 – April 2009)**

| Paired Sample | Sharpe Index t- stat (p-value) | Treynor Index t- stat (p-value) | Jensen Index t- stat (p-value) |
|---|---|---|---|
| Domestic and Regional | -3.980*** (0.000) | -0.528 (0.599) | -0.449 (0.655) |
| Domestic and International | -3.542*** (0.001) | 0.966 (0.338) | 1.258 (0.213) |
| Regional and International | 0.100 (0.921) | 1.446 (0.158) | 1.006 (0.322) |

# CHAPTER FIVE

# CONCLUSIONS AND RECOMMENDATION

## 5.1 Introduction

The objective of this paper is to examine whether there is any difference between Local, Regional and Global funds in Malaysia in term of their return performance and also to investigate whether the motive of international diversification in Malaysian global unit trust funds and regional unit trust funds can be reach or it is just a myth. The study period are divided into the period before recession, the period during the crisis and the period of both before and during recession.

## 5.2 Conclusion

The study first analysed returns from global, regional and local unit trust funds for the period April 2007 to April 2009 where this study blended the period of before and during the crisis. Using the Treynor index and Jensen index, the data

analysis of independent sample t-test result suggests that there is a significant different between local funds and both global and regional funds where local funds outperform global and regional funds. Overall, during the period of April 2007 to April 2009, we can conclude that international funds fail to provide the benefits of international diversification as local funds performance outperform both global and regional funds measured by Treynor's and Jensen index.

**Table 5.1 Rank of Performance April 2007 to April 2009**

| Blended | Sharpe | Treynor | Jensen |
|---|---|---|---|
| Local | 2 | 1 | 1 |
| Regional | 1 | 2 | 2 |
| Global | 3 | 3 | 3 |

On the other hand, the mean return of Sharpe suggests that local and global funds underperformed KLCI while Treynor index suggest that all three categories of funds underperformed KLCI. Earlier studies that found that trust fails to outperform the KLCI benchmark among others are Ewe (1994), Shamser and Anuar (1995), Abdullah et al (2000), Fauziah and Mansor (2007) and Nik Maheran and Masliza (2008).

**Table 5.2 Rank of Performance April 2007 to June 2008**

| non-crisis | Sharpe | Treynor | Jensen |
|---|---|---|---|
| Local | 1 | 1 | 1 |
| Regional | 2 | 2 | 2 |
| Global | 3 | 3 | 3 |

During the period of before crisis, using Sharpe and Jensen index, the results from independent sample t-test suggest that there is a significant different on the performance of local and global funds where local funds outperformed global funds. However, there is no significant different between local and regional funds. The result implies that during the non-crisis period, both local and regional funds would have a better risk and reward profile compared to global funds. Using Sharpe index, all these 3 categories of funds underperformed the KLCI. There is no significant different in performance found using Treynor's index despite the domestic funds outperformed both local and regional funds as well as the KLCI benchmark. The means for Jensen index also suggest local funds outperformed regional and global funds but with no significant different. Overall, analysis on the non-crisis period suggests local fund is a better bet compared to global and regional funds.

**Table 5.2 Rank of Performance July 2008 to April 2009**

| Crisis | Sharpe | Treynor | Jensen |
|---|---|---|---|
| Local | 3 | 2 | 2 |
| Regional | 1 | 1 | 1 |
| Global | 2 | 3 | 3 |

During crisis, local funds failed even to beat the market return. The mean return for local funds was also below the mean return of regional and global funds. Using independent sample t-test to analyse the Sharpe index, we found a significant different on the performance of local and both regional and global funds at 1% significant level. This implies that the global and regional fund provides better risk and reward return at least during the crisis period. No significant different was found

using Treynor's and Jensen index. The result on the crisis period analysis contradicts previous study in the developed market (e.g Butler and Joaquin (2001) and Bracker and Koch (1999)) where they argue that the correlation among indices is more significant during crisis thus the benefit of international diversification is even lesser.

## 5.3 Recommendation

### 5.3.1 Recommendation for investors and fund management companies

As per evidences on the result of this paper analysis, it is felt very comfortable to conclude that it is unnecessary and a waste to invest in an international portfolio. If the investment carries the sole objective of gaining the benefits of international diversification, this paper result provides proves that it has failed to meet its objective. Despite the fact that this paper did not document a total failure of global and regional funds where there are benefits of international diversification during crisis, it is better for investors to pull out their money during crisis and reinvest when market recover. This is because even though global and regional funds outperformed local funds during crisis the return is still negative.

Therefore, it is concluded that international funds (global and regional) that were launched by fund management companies in Malaysia are not promising a better bet compared to local funds and it is just to fulfil the marketing needs of their companies. For this reason, fund management companies are recommended to focus or concentrate on domestic market whereby they are known better and fund

management companies in Malaysia have sufficient knowledge and expertise to handle. As for investors, it is advisable to invest just in local funds as international fund does not add any benefits rather than extra cost and risk and it is believe that as long as there are investors who interested to buy units in international portfolios, fund management companies will keep on launching international funds.

### 5.3.2 Recommendation to future researchers

As what been discussed in the research methodology, this study used data of funds return for the period of only 2 years. Initially, this paper proposed to use return data of 5 years. Surprising, while the data gathering been conducted, it is found that Malaysia does have data of domestic funds return of more than 10 years. However data of return for international funds available for comparison purpose was only for 2 year. There are few international funds (less than 5) that have the return data of 3 and 5 years, however for comparison purposes we have to synchronise and choose to the data of 2 years. The reason behind this situation is not that the Bloomberg database does not keep the data of international funds but international funds in Malaysia itself are new and most of them are in existence for only 2 year. For this reason, it is recommended that future research to analyse the return data of 3 to 5 years in order to get a result that cover longer period of study.

A comparison on the indices comovements with the performances also is a very interesting part to look in as the recent government announcement of financial

liberalization and the adoption of FTSE standard for Bursa Malaysia would encourage more foreign investors and it is believe it will increases the correlation of KLCI index with the other indices.

**References**


Annuar, M.N., Shamsher, M. and Ngu, M.H. (1997), Selectivity and timing: evidence from the performance of Malaysian unit trusts, Pertanika Journal of Social Science and Humanities, Vol. 5, pp. 45-57.

Bodie, Kane and Marcus (2005) Investment, sixth edition. Mc Graw Hill, International Edition.

Chua, C.P., (1985), The investment performance of unit trusts in Malaysia, unpublished MBA thesis

Da Costa, Jr Newton, Silvia Nunes, Paulo Ceretta, and Sergio Da Silva, (2005) Stockmarket comovements revisited. Economics Bulletin, Vol. 7, No. 3 pp. 1-9

Eiteman, Stonehill and Moffett (2007) Multinational Business Finance, elevent edition. Pearson International Edition.

Ewe, S.J. (1994), The performance of Malaysian unit trusts in the period 1988-1992'', unpublished MBA thesis, School of Management, Universiti Sains Malaysia.

Fauziah, Sobri and Joriah (2008) Which is a better unit trust strategy: Follow the winner or buy and hold? Proceedings of The MFA Conference 2008, Parallel Session II (C)

Fikriah, Taufiq and Shamsher (2007) Investigation of performance of Malaysian Islamic unit trust funds: Comparison with conventional unit trust funds, Journal of Managerial Finance, 3 **(**2**),** 142 – 153

Fauziah Md. Taib and Mansor Isa (2007), Malaysian unit trust aggregate performance, Journal of Managerial Finance, 33 **(**2**),** 102 – 121

Gulser Meric, Ricardo P. C. Leal, Mitchell Ratner, Ilhan Meric (2001) Co-movements of U.S. and Latin American equity markets before and after the 1987 crash, International Review of Financial Analysis 10 (2001) 219–235

Hany A. Shawky, Rolf Kuenzel and Azmi D. Mikhail (1997) International Portfolio International Portfolio Diversification: a synthesis and an update. Journal of International Financial Markets, Institutions and Money 7(1997) 303-327

J. Fletcher, A. Marshall (2005) International Financial Markets, Institutions and Money 15 (2005) 455–468

Jensen, M.C. (1968), The performance of mutual funds in the period 1945-1964'', Journal of Finance, Vol. 23, pp. 389-416.

Jensen M.C., 1969, Risk, the pricing of capital assets, and the evaluation of investment portfolios, Journal of Business 42, 167-247

K.C. Butler, D.C. Joaquin (2001) Are the gains from international portfolio diversification exaggerated? The influence of downside risk in bearmarkets Journal of International Money and Finance 21 (2002) 981–1011

Kevin Bracker and Paul D. Koch (1999) Economic Determinants of the correlation Structure Across International Equity Market Journal of Economics and Business 1999; 51:443–471

Leong and Aw (1997). Measuring unit trust fund performance using different benchmarks, Capital Market Review, 5 (2), 27-44

Nik Maheran Nik Muhammad and Masliza Mokhtar (2008) Proceedings of The MFA Conference 2008, Parallel Session II (C)

Shamsher, M. and Annuar, M.N. (1995), The performance of unit trusts in Malaysia: some evidence, Capital Market Review, Vol. 3, pp. 51-69.

Sharpe, W.F., 1996, Mutual fund performance, Journal of Business 39, 119-138.

Soo, W. L and Ghazali, N. (2007), The price linkages between Malaysian unit trust funds and the stock market, Managerial Finance Vol. 33 No. 2, Pp. 89-101

Vivek Bhargava, Daniel K. Konku and D.K Malhorta (2004) Does International diversification pay. Financial Counseling and Planning Volume 15 (1), 2004

Taib, F.M., Lai, H.L., and Shahnon, S (2002), Malaysian Unit Trust Performance, 4th Annual Malaysian Finance Association Symposium Proceedings, Penang, pp.449-474.

Treynor, J.L., (1965), How to Rate Management of Investment Funds, Harvard Review, 43(1), 63-75

W.-J.P Chiou (2008) International Financial Market, Institutions and Money 18 (2008) 466-482

http://www.mutualfundsresource.com/

http:// www.investopedia .com

http://www.invest.com.my

http://www.wikipedia.com

http://www.fmutm.com.my

# APPENDIX

Appendix A

Local Funds April 2007 to April 2009

| Bloomber ticker | UNIT TRUST FUNDS | CAR | AR | StdDev | CV | Beta |
|---|---|---|---|---|---|---|
| PUBPBIE | Public Islamic Equity | -0.227 | -0.005 | 0.035 | -7.359 | 1.006 |
| PUBISOP | Public Islamic Opportunities | -0.015 | -0.003 | 0.030 | -11.026 | 0.716 |
| PUBISEF | Public Equity | -0.095 | -0.003 | 0.027 | -7.676 | 0.754 |
| PACPREM | Pacific Premier | -0.068 | -0.003 | 0.027 | -8.353 | 0.841 |
| PACDIVF | Pacific Dividend | 0.041 | -0.002 | 0.023 | -10.827 | 0.695 |
| KUTEQIS | Kenanga Syariah Growth | 0.217 | 0.000 | 0.019 | -38.782 | 0.603 |
| HLBMAKM | HLG Dana Makmur | -0.052 | -0.003 | 0.025 | -8.288 | 0.767 |
| BHLPDA2 | CIMB-I Small Cap | -0.015 | -0.003 | 0.032 | -11.975 | 0.995 |
| RHBDYFI | RHB Dynamic | -0.030 | -0.003 | 0.024 | -8.612 | 0.815 |
| RHBDIVA | RHB Malaysia Diva | -0.352 | -0.006 | 0.041 | -6.900 | 0.854 |
| RHBISGR | RHB Islamic Growth | 0.050 | -0.002 | 0.026 | -12.508 | 0.824 |
| BHLPDA1 | CIMB-I Dali Equity Growth | 0.090 | -0.002 | 0.026 | -12.508 | 0.869 |
| PHIFETF | Master First Ethical | -0.426 | -0.007 | 0.028 | -15.510 | 0.684 |
| OSKTRAK | OSK-UOB KLCI Tracker | 0.047 | -0.002 | 0.026 | -4.226 | 0.980 |
| OSKTREA | OSK-UOB Smart Treasure | -0.065 | -0.003 | 0.028 | -8.971 | 0.819 |
| RHBCPFI | RHB Capital | -0.053 | -0.003 | 0.024 | -8.006 | 0.794 |
| MAAEIFI | MAAKL Equity Index | 0.126 | -0.001 | 0.029 | -21.689 | 0.909 |
| MAAGROW | MAAKL Growth | 0.163 | -0.001 | 0.026 | -26.448 | 0.821 |
| MAAVALF | MAAKL Value | 0.023 | -0.002 | 0.026 | -11.034 | 0.807 |
| PHIEQGF | Master Equity Growth | -0.014 | -0.003 | 0.022 | -8.065 | 0.661 |
| INGSSCM | ING Tactical | 0.041 | -0.002 | 0.028 | -12.818 | 0.951 |
| KUTENF | Kenanga Growth | 0.279 | 0.000 | 0.042 | 388.663 | 0.842 |
| MAADVDF | MAAKL Dividend | 0.104 | -0.002 | 0.017 | -11.090 | 0.522 |
| MAAEQ80 | MAAKL Equity 80 | -0.013 | -0.003 | 0.030 | -11.126 | 0.976 |
| AMISGR | AMIslamic Growth | 0.195 | -0.001 | 0.046 | -66.233 | 0.740 |
| ABMLTII | AMIttikal | 0.127 | -0.001 | 0.038 | -28.468 | 0.704 |
| AMNEWFR | AMNew Frontier | 0.132 | -0.001 | 0.023 | -17.741 | 0.793 |
| INGBLUE | ING Blue Chip | -0.198 | -0.004 | 0.041 | -9.175 | 0.913 |
| SBBEQIF | CIMB-P Equity Income | -0.095 | -0.003 | 0.033 | -9.502 | 1.079 |
| BHLINDX | CIMB-P KLCI-Linked | 0.049 | -0.002 | 0.027 | -12.829 | 0.990 |
| HLBGROI | HLG Growth | 0.008 | -0.002 | 0.025 | -10.058 | 0.771 |
| KLRSFDI | Public Regular Saving | -0.130 | -0.004 | 0.030 | -7.862 | 0.860 |
| COMFGLI | CIMB-P Equity Aggregate 1 | -0.049 | -0.003 | 0.027 | -8.842 | 0.953 |
| BHLBHGI | CIMB-P Equity 2 | 0.013 | -0.002 | 0.029 | -11.790 | 1.024 |
| SBBPRCI | CIMB-P equity | 0.045 | -0.002 | 0.027 | -12.809 | 0.874 |
| SBBCEQF | CIMB-P Equity Growth | -0.073 | -0.003 | 0.033 | -10.199 | 1.079 |
| ASMFPFI | ASM First Public | 0.003 | -0.003 | 0.021 | -8.148 | 0.599 |
| ASMAINI | AUTB Investment | -0.126 | -0.004 | 0.023 | -6.153 | 0.698 |
| ASMARBI | AUTB Tactical | 0.015 | -0.002 | 0.023 | -9.627 | 0.764 |
| SBBSEQY | CIMB-P Equity Aggregate | -0.157 | -0.004 | 0.031 | -7.706 | 0.995 |
| ABMLCUI | AMCumulative Growth | -0.030 | -0.003 | 0.028 | -9.770 | 0.904 |
| AMDIVIN | AmDividend Income | 0.136 | -0.001 | 0.021 | -16.412 | 0.722 |
| APXTRAK | APEX Enhance Tracker | 0.148 | -0.001 | 0.017 | -15.322 | 0.567 |

| | | | | | | |
|---|---|---|---|---|---|---|
| JFAMGRI | APEX Malaysia Growth | -0.092 | -0.003 | 0.021 | -6.073 | 0.660 |
| KLAGGFI | Public Aggressive Growth | -0.149 | -0.004 | 0.037 | -9.372 | 1.068 |
| AFFEQYF | Affin Equity | -0.178 | -0.004 | 0.030 | -7.078 | 0.829 |
| ALLOPTI | Alliance Optimal Income | -0.074 | -0.003 | 0.018 | -5.595 | 0.389 |
| ALLTACG | Alliance Tactical Growth | 0.172 | -0.001 | 0.048 | -52.522 | 0.323 |
| HIJASWI | AVE ASW (Asnita) | 0.094 | -0.002 | 0.020 | -11.957 | 0.661 |
| PUBPBGF | Public Growth | 0.439 | 0.002 | 0.109 | 67.068 | 0.401 |
| | **Average** | **0.000** | **-0.003** | **0.030** | **-3.986** | **0.797** |

## Regional funds April 2007 to April 2009

| Bloomber ticker | UNIT TRUST FUNDS | CAR | AR | StdDev | CV | Beta |
|---|---|---|---|---|---|---|
| PHASEJI | PHEIM Asia ex Japan Islamic | -0.205 | -0.005 | 0.029 | -6.491 | 0.785 |
| CIMAPAD | CIMB-I Asia Pasific Equity | 0.083 | -0.002 | 0.040 | -22.811 | 0.818 |
| PBISASE | PB Islamic Qquity | -0.010 | -0.003 | 0.033 | -12.476 | 0.991 |
| PHASEJP | PHEIM Asia ex Japan | -0.285 | -0.005 | 0.033 | -6.346 | 0.885 |
| PRUAPEF | PRU Asia Pacific Equity | -0.181 | -0.004 | 0.033 | -7.704 | 0.786 |
| RHBDIV | RHB Dividend Value | -0.352 | -0.006 | 0.041 | -6.900 | 0.854 |
| TASOUTH | TA South East Asia Equity | -0.194 | -0.004 | 0.040 | -9.134 | 1.173 |
| HLGGLHL | HLG Global Health Care | 0.055 | -0.002 | 0.031 | -15.244 | 0.312 |
| HLGAPDV | HLG Asia Pacific Dividend | -0.285 | -0.005 | 0.035 | -6.693 | 0.842 |
| MAAPACF | MAAKL Pacific | -0.153 | -0.004 | 0.035 | -8.862 | 0.936 |
| SBBAEQF | CIMB-P Asian Equity Fund | 0.199 | -0.001 | 0.085 | -129.466 | 0.830 |
| OSKAPAC | OSK-UOB Asia Pacific | -0.117 | -0.004 | 0.091 | -24.766 | 0.670 |
| AMMAPPRO | AMASIA-Pac Prop Equity | -0.287 | -0.005 | 0.051 | -9.682 | 0.978 |
| PBISASE | PB Asia equity | -0.010 | -0.003 | 0.033 | -12.476 | 0.991 |
| PUBFESL | Public Far-East Select | -0.066 | -0.003 | 0.045 | -14.074 | 0.948 |
| CIMBHID | CIMB-P Emerging Asia | -0.072 | -0.003 | 0.037 | -11.483 | 1.039 |
| PUBASIT | Public Asia Ittikal Fund | 0.015 | -0.002 | 0.028 | -11.621 | 0.801 |
| | **AVERAGE** | **-0.110** | **-0.004** | **0.042** | **-18.602** | **0.861** |

## Global funds April 2007 to April 2009

| Bloomber ticker | UNIT TRUST FUNDS | CAR | AR | StdDev | CV | Beta |
|---|---|---|---|---|---|---|
| PRUGLOL | PRU Global Leader | -0.212 | -0.005 | 0.054 | -11.736 | 0.752 |
| PUBGLOS | Public Global Select | -0.106 | -0.004 | 0.025 | -7.086 | 0.633 |
| RHBGLTH | RHB Global Fortune | -0.302 | -0.005 | 0.036 | -6.685 | 0.699 |
| AMOAGIS | AmOasis Global Islamic Equity | -0.154 | -0.004 | 0.029 | -7.336 | 0.503 |
| INGGLDD | ING Global Dividend | -0.305 | -0.005 | 0.032 | -5.938 | 0.545 |
| OSKGEYF | OSK-UOB Global Equity Yield | 0.271 | 0.000 | 0.127 | 3959.869 | 0.684 |
| OSKSTAR | OSK-UOB Global New Star | -0.425 | -0.007 | 0.031 | -4.635 | 0.805 |
| PASTARS | Pacific S&P Global Star | -0.080 | -0.003 | 0.027 | -8.118 | 0.415 |
| HGLOPRO | HDBS Global Property | -0.402 | -0.006 | 0.100 | -15.650 | 0.825 |
| HWAGLOP | HDBS Global Opportunities | -0.124 | -0.004 | 0.037 | -8.361 | 0.789 |
| SBBGLGR | CIMB-P Global Growth | -0.174 | -0.004 | 0.042 | -10.049 | 0.643 |
| CIMTTAN | CIMB-P Global Titan | 0.014 | -0.002 | 0.034 | -14.094 | 0.241 |
| AMPEUPR | AmPan Euro Prop Equities | -0.699 | -0.009 | 0.067 | -7.239 | 0.474 |
| AMSCEUR | AMSchroder Euro Equity Alpha | -0.284 | -0.005 | 0.038 | -7.142 | 0.726 |
| HWAGLEM | HDBS Global Emerging Market | 0.333 | 0.001 | 0.028 | 44.368 | 0.651 |
| AMGLPEQ | AMGlobal Prop Equities | -0.602 | -0.008 | 0.058 | -6.969 | 0.846 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **Average** | **-0.203** | **-0.005** | **0.048** | **242.700** | **0.639** |

Appendix B

Local Funds April 2007 to June 2008

| Bloomber ticker | UNIT TRUST FUNDS | CAR | AR | StdDev | CV | Beta |
|---|---|---|---|---|---|---|
| PUBPBIE | Public Islamic Equity | -0.069 | -0.001 | 0.038 | -46.452 | 1.093 |
| PUBISOP | Public Islamic Opportunities | 0.073 | 0.002 | 0.032 | 20.768 | 0.768 |
| PUBISEF | Public Equity | -0.114 | -0.002 | 0.030 | -19.253 | 0.822 |
| PACPREM | Pacific Premier | 0.000 | 0.000 | 0.026 | 79.093 | 0.832 |
| PACDIVF | Pacific Dividend | 0.049 | 0.001 | 0.024 | 21.183 | 0.708 |
| KUTEQIS | Kenanga Syariah Growth | 0.082 | 0.002 | 0.022 | 13.246 | 0.747 |
| HLBMAKM | HLG Dana Makmur | -0.057 | -0.001 | 0.026 | -41.768 | 0.847 |
| BHLPDA2 | CIMB-I Small Cap | 0.133 | 0.003 | 0.030 | 11.942 | 1.018 |
| RHBDYFI | RHB Dynamic | 0.001 | 0.000 | 0.026 | 78.465 | 0.963 |
| RHBDIVA | RHB Malaysia Diva | -0.257 | -0.004 | 0.045 | -11.379 | 0.777 |
| RHBISGR | RHB Islamic Growth | 0.078 | 0.002 | 0.030 | 18.244 | 1.060 |
| BHLPDA1 | CIMB-I Dali Equity Growth | 0.107 | 0.002 | 0.028 | 18.244 | 0.990 |
| PHIFETF | Master First Ethical | -0.488 | -0.008 | 0.031 | 13.479 | 0.648 |
| OSKTRAK | OSK-UOB KLCI Tracker | 0.022 | 0.001 | 0.027 | -3.938 | 0.983 |
| OSKTREA | OSK-UOB Smart Treasure | -0.008 | 0.000 | 0.033 | 173.949 | 1.080 |
| RHBCPFI | RHB Capital | 0.015 | 0.001 | 0.026 | 45.315 | 0.938 |
| MAAEIFI | MAAKL Equity Index | 0.096 | 0.002 | 0.032 | 16.629 | 0.924 |
| MAAGROW | MAAKL Growth | 0.090 | 0.002 | 0.029 | 15.578 | 0.938 |
| MAAVALF | MAAKL Value | 0.070 | 0.001 | 0.027 | 18.279 | 0.914 |
| PHIEQGF | Master Equity Growth | -0.012 | 0.000 | 0.023 | 190.078 | 0.715 |
| INGSSCM | ING Tactical | 0.087 | 0.002 | 0.029 | 16.167 | 0.972 |
| KUTENF | Kenanga Growth | 0.076 | 0.002 | 0.023 | 14.444 | 0.786 |
| MAADVDF | MAAKL Dividend | -0.052 | -0.001 | 0.019 | -34.895 | 0.547 |
| MAAEQ80 | MAAKL Equity 80 | -0.018 | 0.000 | 0.028 | 1017.477 | 0.964 |
| AMISGR | AMIslamic Growth | 0.154 | 0.003 | 0.059 | 20.442 | 0.855 |
| ABMLTII | AMIttikal | 0.050 | 0.001 | 0.048 | 41.497 | 0.796 |
| AMNEWFR | AMNew Frontier | 0.134 | 0.003 | 0.024 | 9.226 | 0.820 |
| INGBLUE | ING Blue Chip | -0.263 | -0.004 | 0.052 | -12.715 | 1.120 |
| SBBEQIF | CIMB-P Equity Income | 0.067 | 0.001 | 0.031 | 21.463 | 1.035 |
| BHLINDX | CIMB-P KLCI-Linked | 0.024 | 0.001 | 0.027 | 37.180 | 0.997 |
| HLBGROI | HLG Growth | 0.004 | 0.000 | 0.027 | 68.846 | 0.909 |
| KLRSFDI | Public Regular Saving | -0.089 | -0.001 | 0.033 | -28.594 | 0.912 |
| COMFGLI | CIMB-P Equity Aggregate 1 | 0.018 | 0.001 | 0.028 | 43.933 | 0.991 |
| BHLBHGI | CIMB-P Equity 2 | 0.022 | 0.001 | 0.030 | 43.254 | 1.069 |
| SBBPRCI | CIMB-P equity | 0.111 | 0.002 | 0.028 | 12.730 | 0.871 |
| SBBCEQF | CIMB-P Equity Growth | 0.104 | 0.002 | 0.032 | 15.641 | 1.064 |
| ASMFPFI | ASM First Public | -0.096 | -0.001 | 0.023 | -18.388 | 0.648 |
| ASMAINI | AUTB Investment | -0.129 | -0.002 | 0.022 | -12.296 | 0.616 |
| ASMARBI | AUTB Tactical | -0.017 | 0.000 | 0.022 | 642.630 | 0.720 |
| SBBSEQY | CIMB-P Equity Aggregate | 0.045 | 0.001 | 0.033 | 30.181 | 1.083 |
| ABMLCUI | AMCumulative Growth | 0.013 | 0.001 | 0.031 | 56.481 | 1.004 |
| AMDIVIN | AmDividend Income | 0.050 | 0.001 | 0.020 | 17.475 | 0.713 |

| | | | | | | |
|---|---|---|---|---|---|---|
| APXTRAK | APEX Enhance Tracker | 0.022 | 0.001 | 0.017 | 24.894 | 0.601 |
| JFAMGRI | APEX Malaysia Growth | -0.186 | -0.003 | 0.024 | -8.699 | 0.763 |
| KLAGGFI | Public Aggressive Growth | -0.003 | 0.000 | 0.040 | 142.923 | 1.121 |
| AFFEQYF | Affin Equity | -0.252 | -0.004 | 0.034 | -8.724 | 0.904 |
| ALLOPTI | Alliance Optimal Income | -0.122 | -0.002 | 0.018 | -10.470 | 0.331 |
| ALLTACG | Alliance Tactical Growth | 0.061 | 0.001 | 0.023 | 17.476 | 0.784 |
| HIJASWI | AVE ASW (Asnita) | -0.056 | -0.001 | 0.022 | -36.543 | 0.767 |
| PUBPBGF | Public Growth | 0.482 | 0.008 | 0.143 | 17.133 | 0.040 |
| | **Average** | **0.001** | **0.000** | **0.032** | **55.037** | **0.851** |

## Regional Funds April 2007 to June 2008

| Bloomber ticker | UNIT TRUST FUNDS | CAR | AR | StdDev | CV | Beta |
|---|---|---|---|---|---|---|
| PHASEJI | PHEIM Asia ex Japan Islamic | -0.028 | 0.000 | 0.022 | -149.487 | 0.623 |
| CIMAPAD | CIMB-I Asia Pasific Equity | 0.038 | 0.001 | 0.031 | 32.149 | 0.806 |
| PBISASE | PB Islamic Qquity | 0.084 | 0.002 | 0.032 | 18.835 | 1.018 |
| PHASEJP | PHEIM Asia ex Japan | -0.089 | -0.001 | 0.026 | -22.107 | 0.735 |
| PRUAPEF | PRU Asia Pacific Equity | -0.145 | -0.002 | 0.025 | -12.184 | 0.539 |
| RHBDIV | RHB Dividend Value | -0.257 | -0.004 | 0.045 | -11.379 | 0.777 |
| TASOUTH | TA South East Asia Equity | -0.061 | -0.001 | 0.040 | -57.558 | 1.100 |
| HLGGLHL | HLG Global Health Care | -0.120 | -0.002 | 0.015 | -9.102 | 0.181 |
| HLGAPDV | HLG Asia Pacific Dividend | -0.093 | -0.001 | 0.030 | -24.069 | 0.689 |
| MAAPACF | MAAKL Pacific | -0.103 | -0.001 | 0.032 | -23.193 | 0.834 |
| SBBAEQF | CIMB-P Asian Equity Fund | 0.164 | 0.003 | 0.093 | 30.294 | 0.972 |
| OSKAPAC | OSK-UOB Asia Pacific | 0.113 | 0.002 | 0.116 | 52.506 | 0.413 |
| AMMAPPRO | AMASIA-Pac Prop Equity | -0.193 | -0.003 | 0.038 | -13.079 | 0.796 |
| PBISASE | PB Asia equity | 0.084 | 0.002 | 0.032 | 18.835 | 1.018 |
| PUBFESL | Public Far-East Select | 0.018 | 0.001 | 0.044 | 70.669 | 0.770 |
| CIMBHID | CIMB-P Emerging Asia | 0.008 | 0.000 | 0.031 | 67.614 | 0.864 |
| PUBASIT | Public Asia Ittikal Fund | -0.054 | -0.001 | 0.029 | -50.493 | 0.837 |
| | **AVERAGE** | **-0.037** | **0.000** | **0.040** | **-4.809** | **0.763** |

## Global Funds April 2007 to June 2008

| Bloomber ticker | UNIT TRUST FUNDS | CAR | AR | StdDev | CV | Beta |
|---|---|---|---|---|---|---|
| PRUGLOL | PRU Global Leader | 0.002 | 0.000 | 0.047 | 128.520 | 0.394 |
| PUBGLOS | Public Global Select | -0.089 | -0.001 | 0.020 | -17.419 | 0.519 |
| RHBGLTH | RHB Global Fortune | -0.112 | -0.002 | 0.022 | -14.361 | 0.420 |
| AMOAGIS | AmOasis Global Islamic Equity | -0.058 | -0.001 | 0.014 | -22.490 | 0.226 |
| INGGLDD | ING Global Dividend | -0.148 | -0.002 | 0.020 | -9.248 | 0.362 |
| OSKGEYF | OSK-UOB Global Equity Yield | -0.206 | -0.003 | 0.021 | -6.771 | 0.301 |
| OSKSTAR | OSK-UOB Global New Star | -0.186 | -0.003 | 0.031 | -11.205 | 0.807 |
| PASTARS | Pacific S&P Global Star | -0.046 | 0.000 | 0.016 | -36.655 | 0.222 |
| HGLOPRO | HDBS Global Property | -0.018 | 0.000 | 0.119 | 4211.551 | 0.707 |
| HWAGLOP | HDBS Global Opportunities | -0.013 | 0.000 | 0.032 | 318.417 | 0.728 |
| SBBGLGR | CIMB-P Global Growth | -0.074 | -0.001 | 0.037 | -41.163 | 0.418 |
| CIMTTAN | CIMB-P Global Titan | -0.032 | 0.000 | 0.039 | -184.560 | -0.016 |
| AMPEUPR | AmPan Euro Prop Equities | -0.328 | -0.005 | 0.076 | -14.770 | 0.035 |
| AMSCEUR | AMSchroder Euro Equity Alpha | -0.049 | 0.000 | 0.024 | -47.638 | 0.411 |
| HWAGLEM | HDBS Global Emerging Market | 0.151 | 0.003 | 0.026 | 9.229 | 0.643 |

| | | | | | | |
|---|---|---|---|---|---|---|
| AMGLPEQ | AMGlobal Prop Equities | -0.285 | -0.004 | 0.026 | -5.977 | 0.332 |
| | **Average** | **-0.093** | **-0.001** | **0.036** | **265.966** | **0.407** |

## Appendix C

## Local Funds July 2008 to April 2009

| Bloomber ticker | UNIT TRUST FUNDS | CAR | AR | StdDev | CV | Beta |
|---|---|---|---|---|---|---|
| PUBPBIE | Public Islamic Equity | -0.158 | -0.010 | 0.029 | -2.937 | 0.875 |
| PUBISOP | Public Islamic Opportunities | -0.088 | -0.008 | 0.025 | -3.054 | 0.619 |
| PUBISEF | Public Equity | 0.019 | -0.006 | 0.020 | -3.405 | 0.665 |
| PACPREM | Pacific Premier | -0.068 | -0.008 | 0.027 | -3.456 | 0.838 |
| PACDIVF | Pacific Dividend | -0.008 | -0.007 | 0.022 | -3.286 | 0.661 |
| KUTEQIS | Kenanga Syariah Growth | 0.135 | -0.003 | 0.013 | -3.699 | 0.402 |
| HLBMAKM | HLG Dana Makmur | 0.005 | -0.006 | 0.024 | -3.791 | 0.656 |
| BHLPDA2 | CIMB-I Small Cap | -0.148 | -0.010 | 0.034 | -3.485 | 0.933 |
| RHBDYFI | RHB Dynamic | -0.031 | -0.007 | 0.021 | -2.951 | 0.603 |
| RHBDIVA | RHB Malaysia Diva | -0.095 | -0.009 | 0.035 | -4.068 | 0.964 |
| RHBISGR | RHB Islamic Growth | -0.028 | -0.007 | 0.019 | -2.738 | 0.486 |
| BHLPDA1 | CIMB-I Dali Equity Growth | -0.017 | -0.007 | 0.023 | -3.342 | 0.688 |
| PHIFETF | Master First Ethical | 0.063 | -0.005 | 0.024 | -4.770 | 0.774 |
| OSKTRAK | OSK-UOB KLCI Tracker | 0.025 | -0.006 | 0.026 | -4.499 | 0.976 |
| OSKTREA | OSK-UOB Smart Treasure | -0.057 | -0.008 | 0.021 | -2.730 | 0.453 |
| RHBCPFI | RHB Capital | -0.067 | -0.008 | 0.022 | -2.774 | 0.580 |
| MAAEIFI | MAAKL Equity Index | 0.030 | -0.006 | 0.025 | -4.410 | 0.880 |
| MAAGROW | MAAKL Growth | 0.073 | -0.005 | 0.023 | -4.813 | 0.657 |
| MAAVALF | MAAKL Value | -0.047 | -0.007 | 0.023 | -3.082 | 0.642 |
| PHIEQGF | Master Equity Growth | -0.002 | -0.006 | 0.020 | -3.094 | 0.576 |
| INGSSCM | ING Tactical | -0.046 | -0.007 | 0.026 | -3.501 | 0.906 |
| KUTENF | Kenanga Growth | 0.203 | -0.002 | 0.059 | -31.431 | 0.929 |
| MAADVDF | MAAKL Dividend | 0.156 | -0.003 | 0.015 | -5.161 | 0.495 |
| MAAEQ80 | MAAKL Equity 80 | 0.005 | -0.006 | 0.032 | -5.113 | 0.993 |
| AMISGR | AMIslamic Growth | 0.041 | -0.005 | 0.016 | -2.956 | 0.565 |
| ABMLTII | AMIttikal | 0.077 | -0.005 | 0.018 | -3.853 | 0.571 |
| AMNEWFR | AMNew Frontier | -0.002 | -0.006 | 0.021 | -3.262 | 0.736 |
| INGBLUE | ING Blue Chip | 0.065 | -0.005 | 0.019 | -3.773 | 0.660 |
| SBBEQIF | CIMB-P Equity Income | -0.162 | -0.010 | 0.034 | -3.446 | 1.117 |
| BHLINDX | CIMB-P KLCI-Linked | 0.025 | -0.006 | 0.026 | -4.515 | 0.979 |
| HLBGROI | HLG Growth | 0.004 | -0.006 | 0.022 | -3.474 | 0.574 |
| KLRSFDI | Public Regular Saving | -0.041 | -0.007 | 0.024 | -3.336 | 0.787 |
| COMFGLI | CIMB-P Equity Aggregate 1 | -0.067 | -0.008 | 0.025 | -3.129 | 0.891 |
| BHLBHGI | CIMB-P Equity 2 | -0.009 | -0.007 | 0.026 | -4.020 | 0.961 |
| SBBPRCI | CIMB-P equity | -0.065 | -0.008 | 0.026 | -3.269 | 0.855 |
| SBBCEQF | CIMB-P Equity Growth | -0.176 | -0.010 | 0.033 | -3.231 | 1.073 |
| ASMFPFI | ASM First Public | 0.099 | -0.004 | 0.016 | -3.836 | 0.539 |
| ASMAINI | AUTB Investment | 0.003 | -0.006 | 0.024 | -3.782 | 0.810 |

| | | | | | | |
|---|---|---|---|---|---|---|
| ASMARBI | AUTB Tactical | 0.032 | -0.006 | 0.024 | -4.291 | 0.821 |
| SBBSEQY | CIMB-P Equity Aggregate | -0.202 | -0.011 | 0.028 | -2.591 | 0.846 |
| ABMLCUI | AMCumulative Growth | -0.043 | -0.007 | 0.023 | -3.108 | 0.758 |
| AMDIVIN | AmDividend Income | 0.085 | -0.004 | 0.021 | -4.646 | 0.728 |
| APXTRAK | APEX Enhance Tracker | 0.126 | -0.004 | 0.018 | -4.982 | 0.518 |
| JFAMGRI | APEX Malaysia Growth | 0.095 | -0.004 | 0.015 | -3.577 | 0.535 |
| KLAGGFI | Public Aggressive Growth | -0.147 | -0.010 | 0.032 | -3.326 | 0.982 |
| AFFEQYF | Affin Equity | 0.074 | -0.005 | 0.024 | -5.163 | 0.754 |
| ALLOPTI | Alliance Optimal Income | 0.048 | -0.005 | 0.019 | -3.509 | 0.462 |
| ALLTACG | Alliance Tactical Growth | 0.111 | -0.004 | 0.068 | -17.443 | -0.320 |
| HIJASWI | AVE ASW (Asnita) | 0.151 | -0.003 | 0.016 | -5.194 | 0.527 |
| PUBPBGF | Public Growth | -0.043 | -0.007 | 0.026 | -3.557 | 0.821 |
| | **Average** | **-0.001** | **-0.006** | **0.025** | **-4.537** | **0.716** |

Regional Funds July 2008 to April 2009

| Bloomber ticker | UNIT TRUST FUNDS | CAR | AR | StdDev | CV | Beta |
|---|---|---|---|---|---|---|
| PHASEJI | PHEIM Asia ex Japan Islamic | -0.177 | -0.010 | 0.037 | -3.543 | 0.978 |
| CIMAPAD | CIMB-I Asia Pasific Equity | 0.045 | -0.005 | 0.050 | -9.295 | 0.829 |
| PBISASE | PB Islamic Qquity | -0.093 | -0.008 | 0.033 | -3.925 | 0.935 |
| PHASEJP | PHEIM Asia ex Japan | -0.196 | -0.011 | 0.041 | -3.846 | 1.068 |
| PRUAPEF | PRU Asia Pacific Equity | -0.036 | -0.007 | 0.041 | -5.701 | 1.124 |
| RHBDIVA | RHB Dividend Value | -0.095 | -0.009 | 0.035 | -4.068 | 0.964 |
| TASOUTH | TA South East Asia Equity | -0.133 | -0.009 | 0.040 | -4.288 | 1.268 |
| HLGGLHL | HLG Global Health Care | 0.175 | -0.002 | 0.044 | -17.647 | 0.497 |
| HLGAPDV | HLG Asia Pacific Dividend | -0.192 | -0.011 | 0.041 | -3.880 | 1.030 |
| MAAPACF | MAAKL Pacific | -0.050 | -0.007 | 0.040 | -5.287 | 1.074 |
| SBBAEQF | CIMB-P Asian Equity Fund | 0.035 | -0.006 | 0.074 | -13.133 | 0.620 |
| OSKAPAC | OSK-UOB Asia Pacific | -0.230 | -0.011 | 0.038 | -3.346 | 0.970 |
| AMMAPPRO | AMASIA-Pac Prop Equity | -0.094 | -0.008 | 0.065 | -7.694 | 1.230 |
| PBISASE | PB Asia equity | -0.093 | -0.008 | 0.033 | -3.925 | 0.935 |
| PUBFESL | Public Far-East Select | -0.083 | -0.008 | 0.046 | -5.554 | 1.176 |
| CIMBHID | CIMB-P Emerging Asia | -0.080 | -0.008 | 0.044 | -5.433 | 1.268 |
| PUBASIT | Public Asia Ittikal Fund | 0.069 | -0.005 | 0.027 | -5.515 | 0.757 |
| | **AVERAGE** | **-0.072** | **-0.008** | **0.043** | **-6.240** | **0.984** |

Global Funds July 2008 to April 2009

| Bloomber ticker | UNIT TRUST FUNDS | CAR | AR | StdDev | CV | Beta |
|---|---|---|---|---|---|---|
| PRUGLOL | PRU Global Leader | -0.214 | -0.011 | 0.061 | -5.488 | 1.204 |
| PUBGLOS | Public Global Select | -0.017 | -0.007 | 0.031 | -4.525 | 0.781 |
| RHBGLTH | RHB Global Fortune | -0.190 | -0.011 | 0.049 | -4.624 | 1.054 |
| AMOAGIS | AmOasis Global Islamic Equity | -0.096 | -0.009 | 0.042 | -4.893 | 0.853 |
| INGGLDD | ING Global Dividend | -0.158 | -0.010 | 0.044 | -4.437 | 0.771 |
| OSKGEYF | OSK-UOB Global Equity Yield | 0.477 | 0.004 | 0.194 | 45.904 | 1.271 |
| OSKSTAR | OSK-UOB Global New Star | -0.239 | -0.012 | 0.029 | -2.516 | 0.783 |
| PASTARS | Pacific S&P Global Star | -0.034 | -0.007 | 0.036 | -5.104 | 0.656 |
| HGLOPRO | HDBS Global Property | -0.385 | -0.015 | 0.067 | -4.492 | 0.933 |
| HWAGLOP | HDBS Global Opportunities | -0.110 | -0.010 | 0.043 | -4.085 | 0.843 |
| SBBGLGR | CIMB-P Global Growth | -0.100 | -0.009 | 0.048 | -5.589 | 0.929 |
| CIMTTAN | CIMB-P Global Titan | 0.046 | -0.005 | 0.027 | -4.951 | 0.572 |
| AMPEUPR | AmPan Euro Prop Equities | -0.371 | -0.015 | 0.052 | -3.567 | 1.037 |
| AMSCEUR | AMSchroder Euro Equity Alpha | -0.235 | -0.012 | 0.050 | -4.314 | 1.120 |

| | | | | | | |
|---|---|---|---|---|---|---|
| HWAGLEM | HDBS Global Emerging Market | 0.182 | -0.002 | 0.029 | -12.446 | 0.657 |
| AMGLPEQ | AMGlobal Prop Equities | -0.317 | -0.013 | 0.083 | -6.179 | 1.526 |
| | **Average** | **-0.110** | **-0.009** | **0.055** | **-1.957** | **0.937** |

# SPSS –COMPARE MEAN (RECESSION)

## TREYNOR: DOMESTIC VS INTERNATION

**Group Statistics**

| | VAR00001 | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| TD | 1.00 | 51 | -.00905369635413 | .004151200791172 | .000581284379268 |
| | 2.00 | 17 | -.01024419538843 | .004454023689311 | .001080259419414 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| TD | Equal variances assumed | .139 | .711 | 1.006 | 66 | .318 | .001190499034297 | .001183686213273 | -.001172806742327 | .003553804810922 |
| | Equal variances not assumed | | | .970 | 25.912 | .341 | .001190499034297 | .001226724069550 | -.001331486236215 | .003712484304810 |

NO SIGNIFICANT DIFFERENT

## TREYNOR: DOMESTIC VS REGIONAL

**Group Statistics**

| | VAR00001 | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| TD | 1.00 | 51 | -.00905369635413 | .004151200791172 | .000581284379268 |
| | 2.00 | 18 | -.00849693912869 | .001810435757927 | .000426723800444 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| TD | Equal variances assumed | 1.030 | .314 | -.549 | 67 | .585 | -.000556757225446 | .001014452920813 | -.002581613730154 | .001468099279262 |
| | Equal variances not assumed | | | -.772 | 63.862 | .443 | -.000556757225446 | .000721099668178 | -.001997379365909 | .000883864915017 |

NO SIGNIFICANT DIFFERENT

## SHARPE : DOMESTIC – INTERNATION

**Group Statistics**

| | VAR00001 | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| SD | 1.00 | 51 | -.28605798231820 | .068937574651670 | .009653191282593 |
| | 2.00 | 17 | -.20985770506585 | .086552374227735 | .020992034181702 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| SD | Equal variances assumed | .018 | .893 | -3.697 | 66 | .000 | -.076200277252356 | .020611001904750 | -.117351470294329 | -.035049084210382 |
| | Equal variances not assumed | | | -3.298 | 23.151 | .003 | -.076200277252356 | .023105185587311 | -.123979753253269 | -.028420801251443 |

- **DOMESTIC OUTPERFORMED INTERNATIONAL AND REGIONAL**

## SHARPE: DOMESTIC- REGIONAL

**Group Statistics**

| | VAR00001 | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| SD | 1.00 | 51 | -.28605798231820 | .068937574651670 | .009653191282593 |
| | 2.00 | 18 | -.20716405455765 | .071311168368840 | .016808203575981 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| SD | Equal variances assumed | .307 | .581 | -4.138 | 67 | .000 | -.078893927760552 | .019067103606573 | -.116952025846330 | -.040835829674775 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Equal variances not assumed | | | -4.070 | 28.992 | .000 | -.078893927760552 | .019382977309741 | -.118537069725650 | -.039250785795454 |

- **DOMESTIC OUTPERFORMED INTERNATIONAL AND REGIONAL**

# JENSEN: DOMESTIC – INTERNATIONAL

**Group Statistics**

| | VAR00001 | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| JD | 1.00 | 51 | -.00194731707368 | .001835143233766 | .000256971452158 |
| | 2.00 | 17 | -.00297638872062 | .004680186432752 | .001135111941754 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| JD | Equal variances assumed | 4.413 | .039 | 1.311 | 66 | .195 | .001029071646941 | .000785227432905 | -.000538685506382 | .002596828800264 |
| | Equal variances not assumed | | | .884 | 17.667 | .388 | .001029071646941 | .001163835661740 | -.001419362341013 | .003477505634895 |

THERE IS NO SIGNIFICANT DIFFERENT IN PERFORMANCE

# JENSEN: DOMESTIC – REGIONAL

**Group Statistics**

| | VAR00001 | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| JD | 1.00 | 51 | -.00194731707368 | .001835143233766 | .000256971452158 |
| | 2.00 | 18 | -.00171610960056 | .001723145851891 | .000406149372282 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| JD | Equal variances assumed | .001 | .977 | -.467 | 67 | .642 | -.000231207473120 | .000495511157375 | -.001220251882753 | .000757836936513 |
| | Equal variances not assumed | | | -.481 | 31.612 | .634 | -.000231207473120 | .000480615896355 | -.001210660945996 | .000748245999756 |

NO SIGNIFICANT DIFFERENT IN PERFORMANCE

## TREYNOR: REGIONAL – INTERNATIONAL

**Group Statistics**

| | VAR00003 | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| TR | 1.00 | 18 | -.00849693912869 | .001810435757927 | .000426723800444 |
| | 2.00 | 17 | -.01024419538843 | .004454023689311 | .001080259419414 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| TR | Equal variances assumed | 1.971 | .170 | 1.536 | 33 | .134 | .001747256259744 | .001137230782575 | -.000566457164136 | .004060969683623 |
| | Equal variances not assumed | | | 1.504 | 20.904 | .147 | .001747256259744 | .001161487673244 | -.000668866350445 | .004163378869932 |

**NO SIGNIFICANT DIFFERENT IN PERFORMANCE**

## SHARPE: REGIONAL – INTERNATIONAL

**Group Statistics**

| | VAR00003 | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| SR | 1.00 | 18 | -.20716405455765 | .071311168368840 | .016808203575981 |
| | 2.00 | 17 | -.20985770506585 | .086552374227735 | .020992034181702 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| SR | Equal variances assumed | .069 | .795 | .101 | 33 | .920 | .002693650508196 | .026740981524617 | -.051711285472440 | .057098586488833 |
| | Equal variances not assumed | | | .100 | 31.072 | .921 | .002693650508196 | .026892028680212 | -.052147859658453 | .057535160674846 |

**NO SIGNIFICANT DIFFERENT IN PERFORMANCE**

## JENSEN: REGIONAL – INTERNATIONAL

**Group Statistics**

| | VAR00003 | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| JR | 1.00 | 18 | -.001716109600 56 | .001723145851891 | .000406149372 282 |
| | 2.00 | 17 | -.002976388720 62 | .004680186432752 | .001135111941 754 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| JR | Equal variances assumed | 1.813 | .187 | 1.069 | 33 | .293 | .001260279120061 | .001178847961225 | -.001138105090417 | .003658663330539 |
| | Equal variances not assumed | | | 1.045 | 20.050 | .308 | .001260279120061 | .001205585514560 | -.001254128236194 | .003774686476316 |

## Regional and International (April 2007 to June 2008)

**Group Statistics**

| | Category | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| TreynorIndex | Regional | 17 | -.0014041 | .00362813 | .00087995 |
| | International | 16 | -.0111512 | .04090737 | .01022684 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| TreynorIndex | Equal variances assumed | 3.518 | .070 | .979 | 31 | .335 | .00974706 | .00995298 | -.01055218 | .03004630 |
| | Equal variances not assumed | | | .950 | 15.222 | .357 | .00974706 | .01026463 | -.01210370 | .03159783 |

**Group Statistics**

| | Category | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| SharpeIndex | Regional | 17 | -.0298543 | .05334636 | .01293839 |
| | International | 16 | -.0581669 | .06818487 | .01704622 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| SharpeIndex | Equal variances assumed | .369 | .548 | 1.333 | 31 | .192 | .02831258 | .02123986 | -.01500640 | .07163157 |
| | Equal variances not assumed | | | 1.323 | 28.419 | .196 | .02831258 | .02140036 | -.01549497 | .07212014 |

**Group Statistics**

| | Category | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Jensen | Regional | 17 | -.0006327 | .00188841 | .00045801 |
| | International | 16 | -.0015780 | .00196031 | .00049008 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Jensen | Equal variances assumed | .022 | .884 | 1.411 | 31 | .168 | .00094536 | .00067000 | -.00042110 | .00231183 |
| | Equal variances not assumed | | | 1.409 | 30.694 | .169 | .00094536 | .00067078 | -.00042325 | .00231398 |

Regional and international (July 2007 to April 2009)

**Group Statistics**

| | Category | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Treynor | Reginal | 17 | -.0084969 | .00186615 | .00045261 |
| | Global | 16 | -.0102442 | .00460010 | .00115002 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Treynor | Equal variances assumed | 2.097 | .158 | 1.446 | 31 | .158 | .00174726 | .00120844 | -.00071737 | .00421188 |
| | Equal variances not assumed | | | 1.414 | 19.567 | .173 | .00174726 | .00123588 | -.00083442 | .00432893 |

**Group Statistics**

| | Category | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Sharpe | Reginal | 17 | -.2071641 | .07350587 | .01782779 |
| | Global | 16 | -.2100000 | .08944272 | .02236068 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sharpe | Equal variances assumed | .099 | .756 | .100 | 31 | .921 | .00283595 | .02842490 | -.05513702 | .06080891 |
| | Equal variances not assumed | | | .099 | 29.105 | .922 | .00283595 | .02859773 | -.05564378 | .06131567 |

**Group Statistics**

| | Category | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Jensen | Reginal | 17 | -.0017161 | .00177618 | .00043079 |
| | Global | 16 | -.0029764 | .00483368 | .00120842 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Jensen | Equal variances assumed | 1.902 | .178 | 1.006 | 31 | .322 | .00126028 | .00125266 | -.00129454 | .00381510 |
| | Equal variances not assumed | | | .982 | 18.771 | .338 | .00126028 | .00128291 | -.00142710 | .00394766 |

Local and Global April 2007 to June 2008

**Group Statistics**

| | Category | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| TreynorIndex | Local | 50 | .0035926 | .02850854 | .00403172 |
| | Global | 16 | -.0111512 | .04090737 | .01022684 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| TreynorIndex | Equal variances assumed | 1.705 | .196 | 1.612 | 64 | .112 | .01474377 | .00914837 | -.00353221 | .03301975 |
| | Equal variances not assumed | | | 1.341 | 19.878 | .195 | .01474377 | .01099286 | -.00819598 | .03768351 |

**Group Statistics**

| | Category | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| SharpeIndex | Local | 50 | -.0043837 | .06632634 | .00937996 |
| | Global | 16 | -.0581669 | .06818487 | .01704622 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| SharpeIndex | Equal variances assumed | .046 | .831 | 2.805 | 64 | .007 | .05378325 | .01917724 | .01547231 | .09209418 |
| | Equal variances not assumed | | | 2.764 | 24.764 | .011 | .05378325 | .01945655 | .01369237 | .09387412 |

**Group Statistics**

| | Category | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Jensen | Local | 50 | .0000103 | .00231815 | .00032784 |
| | Global | 16 | -.0015780 | .00196031 | .00049008 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Jensen | Equal variances assumed | .023 | .879 | 2.469 | 64 | .016 | .00158831 | .00064322 | .00030332 | .00287330 |
| | Equal variances not assumed | | | 2.694 | 29.613 | .012 | .00158831 | .00058962 | .00038348 | .00279314 |