CHAPTER 3

LITERATURE REVIEW

3.1 INTRODUCTION

This chapter reviews the related financial theories in the study. Theories found in the finance literature concerning the risk and return of unit trusts are discussed. The four major theories underlining this mutual funds research are the Modern Portfolio Theory (Markowitz 1952), Capital Asset Pricing Theory (Lintner, 1965; Sharpe 1966), Efficient Market Theory (Fama, 1970, 1991) and the Behavioural Finance Theory (Kahneman and Tversky, 1979). As unit trust funds are a managed portfolio investment of stocks, bonds and money market instruments, the Modern Portfolio Theory is the main theory in this research for forming the key hypotheses and analysing the results of the risk and return of unit trust families. The Efficient Market Theory and the Behavioural Finance Theory, two conflicting capital market theories, are discussed. These theories provide the understanding of a rational person, theoretical work on the market, and what result the actions of a rational person will cause.

3.2 THEORETICAL DEVELOPMENT

The four main capital theories that govern the evaluation of mutual funds risk and return analysis are the Theory of Portfolio Selection, Theory of Efficient Market Hypothesis, the Theory of Pricing of Capital Assets and the Theory of Behavioural Finance. Mutual funds research began to arise extensively in the 1960s starting with Treynor (1965), Sharpe (1966), Jensen (1968) and others. The Behavioural Theory is also discussed, as this theory helps to explain results that deviate from those predicted by the classical financial theories, the so-called anomaly.

3.2.1 The Theory of Portfolio

Modern Portfolio Theory proposed by Markowitz (1952), provides the foundation of all the investment models we have today, including those in mutual fund studies. Markowitz provided an insight into the portfolio decision making process of individual investors, showing that investors should select their portfolio based on the combined risk and reward characteristics of the portfolio, rather than selecting securities based on the individual characteristics of the assets. Modern Portfolio Theory is a concept of making security selection choices based on portfolio expected returns and risks. It uses the diversification rationale to reduce the total risk. Investors can lower portfolio risk by holding more assets, which are not perfectly positively correlated. Investors should hold securities with returns that are not moving in the same direction. The negative returns of some investments in a portfolio can be compensated for by the positive returns of others. In addition, it is better that investors hold two or more assets that are negatively correlated. This portfolio will give similar return with substantially less volatility, measured by standard deviation. This is diversification. Generally, a portfolio of twenty to thirty securities will have a substantial risk reduction compared to portfolios only holding one or two securities. In a portfolio of investors, the total risk of a security is less important than the effect it has on the whole portfolio. This is on the basis that if asset returns have low correlations with other asset returns in a portfolio, the portfolio risk will be reduced.

Evans and Archer (1968) documented that approximately ten randomly selected stocks in a portfolio are able to achieve the benefits of diversification. Statman (1987) showed that thirty to forty stocks are needed for a well-diversified portfolio, assuming the existence of a risk-free asset. Elton and Gruber (1977) provided evidence that the portfolio standard deviation is eliminated by half when the number of securities in a

portfolio increases from one to ten, as compared to a reduction of standard deviation of an additional 2 per cent if the number of securities increases from ten to twenty.

However, O'Neal (1997), in his study, analysed the appropriate number of mutual funds that constitute a diversified portfolio, and argued that about seventy to eighty securities is held in average growth funds. If an investor holds two different funds in his portfolio, the reduction in time series standard deviations of portfolio returns is only minimal. Portfolio risk can be eliminated by investors merely by holding combinations of securities that are not perfectly positively correlated. If securities in a portfolio are perfectly positively correlated, the portfolio volatility, usually measured by standard deviation, will be equal to the weighted sum of the individual securities' standard deviations. If the securities in a portfolio are perfectly uncorrelated or the correlation is equal to zero, the portfolio variance is calculated as the sum of the individual asset weights squared times the individual asset variance. If the securities are inversely correlated or less than zero, the portfolio variance will be the least. Hence, correlation plays an important role in portfolio diversification. The correlation, measured the strength and direction of a linear relationship between the price movements of two assets.

Covariance is a measure of the relationship between the two assets, which measures the extent the two securities move together. The correlation between two assets i and j is measured as the covariance of the two assets divided by the standard deviation of asset i multiplied by standard deviation of asset j.

$$\mathrm{COR}_{ij} = \rho_{ij} = \frac{\mathrm{COV}_{ij}}{\sigma_i \sigma_j}$$

Cov_{ij} = The covariance between the rates of return for assets i and j,
σ_i, = The standard deviation of the rate of return for asset i,
σ_j = The standard deviation of the rate of return for asset j.

The portfolio variance is the total individual asset variances multiplied by the square of their weight plus another term called covariance. The first term on the RHS is the variance of returns of the asset; and the second term on the RHS is the covariance between the returns of the two assets. The covariance is a very important concept in an asset's portfolio risk computation. Covariance is a statistical measure of correlation of the fluctuations of two different variables observed in the same mean time period. Usually, covariance is computed between the rates of return of different investments and the correlation of their year-to-year fluctuations in return is assessed.

The variance of a portfolio, σ_p^2, is the expected value of the squared deviation of the portfolio return from the mean portfolio return. The risk of the portfolio is calculated as:

$$\sigma_p^2 = X_1^2\sigma_1^2 + X_2^2\sigma_2^2 + 2\,X_1X_2\rho_{12}\sigma_1\sigma_2$$

$$\sigma_p^2 = \sum_{i=1}^{N} X_i^2\,\sigma_j^2 + \sum_{i=1}^{2}\sum_{\substack{j=1 \\ j\neq i}}^{2} X_i\,X_j\sigma_{ij}$$

Where,

X_i = The weight of individual asset in the portfolio, the fraction of value of asset in the portfolio.

σ_i^2 = The variance of rate of return for asset i.

σ_{ij} = The covariance between the rates of return for assets i and j, where $\sigma_{ij} = \rho_{ij}\sigma_i\sigma_j$, the correlation between the rates of return for assets i and j, multiplied by the standard deviation of the rate of return for asset i and j.

ρ_{ij} = The correlation between the rates of return for assets i and j.

Extending from the two assets portfolio, Elton *et al.* (2007) restated the formula for variance of multi assets portfolio. It is assumed that equal amounts are invested in each asset, with N assets and the proportion invested in each asset as 1/N.

$$\sigma_p^2 = \frac{1}{N}\sigma_j^2 + \frac{N-1}{N}\sigma_{jk}$$

Where,

σ_j^2 = The average variance of the stocks in the portfolio,

σ_{jk} = The covariance between the rates of return for assets j and k,

N = The number of securities in the portfolio.

j and k = Stocks in the portfolio.

As N gets bigger, the variance of individual securities goes to zero, implying that individual risk can be diversified away. However, as N gets bigger, the covariance term move towards the average covariance. It cannot be diversified away. Thus, as the number of securities of portfolio increase, the variance of portfolio decreases. The minimum variance is achieved when the portfolio variance is equal to the average covariance between all stocks in the portfolio. The relationship explains the effect of diversification on portfolio risk. Portfolio risk can be reduced by holding a widely diversified portfolio.

Elton *et al.* (2007) examined the factors in the return correlation and they showed that risk is divided into two distinct components – the market and the non-market risk or the idiosyncratic risk (Sharpe, 1972). The market or the systematic risk is a part of total variance, which is explained by the variance in the market return. This arises, as the future price of a security is difficult to predict. This risk depends on the degree to which the security price is responsive to the market movement. The non-market risk or the idiosyncratic risk is the unexplained variance, that is, the part of the total variance that is due to the stock's unique characteristic. It is free of market movement.

Sharpe (1972) showed that two portfolios with similar diversification will probably have the same total of non-market risk. Therefore, such risk depends on the extent of its diversification. As the diversification increases, the total unsystematic risk will decrease, but not proportionately. There are two basic sources of correlation between

assets, the market-based correlation and the non-market related correlation – known as idiosyncratic correlation. Only the systematic risk that investors incur will be rewarded. The idiosyncratic risk can be diversified away by holding portfolios of securities, and, hence, will not be rewarded by the market.

Markowitz assumed that investment decisions are only based on two variables, the levels of expected return and the expected risk. Therefore, the portfolio with the highest expected return or the lowest risk level will be preferred. The main concern in portfolio management is the portfolio performance evaluation, which is divided into two different features. First, the ability of the unit trust managers to improve the portfolio performance by predicting future prices of the fund. Second, the ability of the unit trust managers to lower the portfolio risk through effective diversification. Therefore, the relevant risk must be taken into account when evaluating the return of a portfolio.

Treynor (1965), borrowing the results obtained from portfolio analysis, suggested new predictors of mutual fund performance. Sharpe (1966), extending Treynor's work and incorporating the Capital Theory, suggested another model for mutual fund performance evaluation. Portfolio analysis describes the useful techniques for portfolio selection based on the best predicted performance. Both the expected risk and return are taken into account in the portfolio analysis. The role of portfolio analysts is to predict the portfolio performance based on the securities performance; and select the most efficient portfolio among a large number of portfolios. Mutual funds emphasise diversification and identify the incorrectly priced securities. Without being able to identify investor preferences for risk and returns, mutual fund managers will select a particular risk level with the corresponding expected return. Investors with the same preference will be attracted to invest in the portfolio of funds.

In practice, mutual fund management describes the general level of risk proposed for the fund's portfolio, the fund then selects the efficient portfolio with the highest expected return. Sharpe (1966) argued that there is a wide range of choice of different stocks available for fund investment managers to diversify their portfolio.

3.2.2 Capital Asset Pricing Theory

The Capital Asset Pricing Model (CAPM) provides a framework for asset managers and portfolios of fund performance assessment. It is a tool for adjusting returns for risks, and is related to the prediction of future mutual fund performance. Performance may be assessed both in terms of return, linking to its risk, as returns can be amplified by experiencing more risk. The well accepted methods in the literature concerning mutual fund performance evaluation all stem directly from the CAPM of Capital Market Theory.

CAPM is a model to price risky assets. It describes the relationship between risk and expected return. It uses beta to link the notion of risks and returns. CAPM is the expected return of a security or a portfolio. It is calculated as the rate of risk-free security plus a risk premium. Investment is only undertaken if this expected return meets the minimum required return. The security market line plots the betas of the CAPM for all different risks.

$$R_j = R_f + \beta_j(R_m - R_f)$$

Where,

R_j = The measure of the rate of return of the asset,
R_f = Return on a risk free asset
β_j = Sensitivity of expected assets returns to expected market return
R_m = Expected Market return

The formula for the beta of an asset within a portfolio is:

$$\beta_j = \frac{\mathrm{Cov}(r_j, r_m)}{\mathrm{Var}(r_m)}$$

Where,

β_j = Sensitivity of expected assets returns to expected market return,

r_j = The measure of the rate of return of the asset,

r_m = The measures the rate of return of the market,

$\mathrm{Cov}(r_j, r_m)$ = The covariance between the rates of return.

In the CAPM formulation, the portfolio is the market portfolio that contains all risky assets, and so r_p is replaced by r_m, the rate of return of the market. When the rate of return of an asset is plotted on the y-axis and beta on the x-axis, the security market line is obtained.

The Markowitz (1952) concerns the pricing of porfolios given the risk levels. CAPM extends the portfolio model to the pricing of individual risky assets. The CAPM is attributed to Sharpe (1964), Lintner (1965) and Mossin (1966) whose independent work came to the same pricing conclusion. The model is comprehensively reviewed by Jensen (1972). It is a model of a perfectly informed market in which the prices are exogenously stipulated. Sharpe (1964) extended and simplified Markowitz's Portfolio Risk and Reward Theory by linking a portfolio to a single risk factor. He developed a practical means to assess to the way various securities correlate with each other, the Capital Asset Pricing Model.

Sharpe (1964) developed a way to measure this non-diversifiable risk, the market risk, otherwise known as systematic risk, or Beta. These are the risks that cannot be diversified away. The other risk, which is specific to an individual company, is known

as unsystematic risk. Diversification reduces unsystematic risk. Conversely, systematic risk is certain happenings that affect all companies at the same time. This is also known as market factors, such as inflation, change in interest rates, or incidents that influence the whole economy. This risk can be eliminated through efficient diversification. Since investors are only rewarded for the market risk, beta plays a very important role in portfolio management.

In the performance evaluation by Jensen (1968), assuming that CAPM gives a valid description of capital assets pricing in equilibrium, the security market line (SML), which exhibits the linear relationship of returns and beta of the portfolio is used. If residual positive returns are obtained, the portfolio is said to earn in excess of equilibrium returns on portfolios of similar risk, thus, alpha is known as the abnormal returns.

Roll (1977) criticised that CAPM refers to the equilibrium relations among security prices that result when investors have similar beliefs and information. They choose their portfolios based on the mean-variance criterion function. CAPM is not testable, as the market portfolio of all risky assets can never be identified. Thus, Jensen's measure of abnormal mutual performance can only occur when the market proxy is inefficient. He also suggested that Jensen's measure is not ideal because there is no appropriate benchmark portfolio for beta computation; benchmarks that are mean-variance inefficient provide incorrect inferences.

The Capital Asset Pricing Model (CAPM) was the main theory in defining alpha until it was challenged by Fama and French (1993) who developed the Fama French three-factor model and linked expected returns to two more factors – size sensitivity and the

price sensitivity. The deviation of a portfolio from the securities market line is measured by the alpha. It is the difference between the expected returns of a portfolio and its required returns. Only market risk is considered in CAPM and alpha is the abnormal return of a particular portfolio compared to the market portfolio. Under the Fama French three-factors model, there are three equity risk factors instead of one broad market index. The ex-ante CAPM must be transformed to an ex-post equation.

The performance of unit trusts is the main concern of the unit trusts investors and the suggested performance measurements are grounded on the CAPM model.

3.2.3 Performance Measurement

Various approaches have been used to calculate the fund returns by past researchers to study the performance of fund managers. Evaluating the performance of unit trusts requires an understanding of the components of the returns. The most commonly used performance measures in financial literature are briefly described below. These methods of performance evaluation of fund managers use the risk-reward ratios by Treynor (1965), Sharpe (1966) and Jensen (1968). These are the ratios measuring the excess return over the borrowing rate or lending rate adjusted for risk.

The average total return is the most basic and simple measure of fund returns. It can be used to compare to the average return of the benchmark. This return is known as the discrete return. The main criticism against this measurement is that risk is ignored to achieve the return.

The natural log function of the continuous raw returns is used. Unit trust funds return is calculated as the natural log function produces better return distribution when the

returns are not normal. However, skewness is sensitive to log transformation (Singleton and Wingender, 1986). The formula is as follows:

$$R_{j,t} = \log_e \frac{NAV_{j,t}+D_{j,t}}{NAV_{j,t-1}}$$

Where,

$R_{j,t}$ = Monthly continuously compounded rate of return of the jth unit trust fund during month t;

$NAV_{j,t}$ = Net asset value for unit trust fund j at the end of month t ;

$D_{j,t}$ = Dividend per unit paid by unit trust fund j during month t ;

The Risk-adjusted Non-regression Approach

The first composite measure of portfolio performance that incorporates risk is provided by Treynor (1965). This performance measure is relevant to all investors, regardless of their personal risk profiles. He argued that the two forms of relevant risk are the market risk and the securities individual specific. It is calculated as the ratio of a fund average excess return per unit of the fund's beta. It measures the returns earned in excess of the return earned on a risk-free asset (for example, treasury bills) per unit of market risk (beta). The Treynor Model is more suitable for comparing the performance of well-diversified portfolios as the model only takes into account the systematic risk.

Treynor = (Portfolio Return - Risk-Free Return) / Beta.

$$TR_p = \frac{R_p - R_f}{\beta_p}$$

Where,

TR_p = Treynor ratio

R_p = The portfolio return,

R_f = The risk free rate of return,

β_p = The portfolio beta, the systematic risk of the portfolio, the relationship of the portfolio return to the market.

The weakness of the Treynor Index is that, according to Goetzmann and Massa (2002), it is subject to manipulation. This ratio can be improved by reducing the beta value.

Another non-regression performance measures based on the implication of CAPM is the Sharpe ratio. In developing the Sharpe ratio, Sharpe (1966) claimed that the ex-post value of the portfolio average rate of return and the actual standard deviation must be used to replace its expected value, since the expected value of risk and returns cannot be obtained accurately. In a perfect capital market, no security will be incorrectly priced, thus, the mutual funds role is to focus on diversification and picking the suitable risk class. Sharpe concluded that the difference in mutual fund performance is mainly due to the difference in objectives, where the high return of a portfolio is associated with high risk. Hence, a good fund manager should focus on diversification and risk assessment, rather than spending resources in identifying incorrectly priced securities. If CAPM holds in every market and if the market is efficient, abnormal positive or negative performance will not be observed. However, this positive or negative performance can arise from the differences in ability of fund managers in picking stocks and timing the market as a result of some manager possession of private information not owned by the market.

The Sharpe ratio (1966) is quite similar to the Treynor measure. The only difference is the risk measure. It measured the risk adjusted measure of asset performance, which calculates a portfolio's mean excess return, in excess to the risk-free return, per unit of the total portfolio risk (the standard deviation) of a unit trust fund, j. It calculates a ranking number that represents the excess return per unit of total risk it exposed. The Sharpe ratio is calculated as the difference between the portfolio return and the risk free rate, divided by the standard deviation of the asset.

Sharpe = Risk Premium / Total Risk

$$SR_p = \frac{R_p - R_f}{\sigma_p}$$

Where,

SR = The Sharpe ratio,
R_p = The asset return,
R_f = The risk free rate of return,
σ_p = The standard deviation of the portfolio's return.

In Sharpe's paper, he found a large cross-sectional variation in this ratio and commented that it is due to either high fund expenses or the difference in management skills. When comparing two investments with the same benchmark (the risk free asset) the one with a higher Sharpe Ratio gives a better return with the same level of risk. This model takes into account the total portfolio risk instead of systematic risk. It is an appropriate model to measure the performance of a portfolio when the performance is compared to another benchmark portfolio, such as another index. The returns measure is adjusted for total portfolio risk. This measure is useful when evaluating the performance evaluation of two mutually exclusive portfolios. The attractiveness of the Sharpe Ratio is its simplicity. It is simple because funds can be ranked based on only a single figure. If fund returns are higher with the same level of risk or if the risk is lowered with the same level of return, the fund is rewarded by a high ratio. According to Sharpe, the Sharpe ratio should not be used alone without considering the correlation between the two assets in a portfolio. Hendriksson and Merton (1981) criticised its non-linearity, which limits its usefulness.

The Regression Approach

Single-factor Model

Jensen (1968) came out with the most prominent performance measures in financial literature two years after Sharpe's index. This model is based on the concept of Capital Asset Pricing Model. It measures the difference between a fund's actual return and the expected return on a benchmark portfolio when the risk is kept at the same level. The

Jensen Alpha is the return of a portfolio in excess of the predicted return by the CAPM. It measures the abnormal returns earned from active management. This model assumes that the randomly constructed portfolio has an Alpha (α_j) value of zero. The main difference between this Jensen Measure and the CAPM is that actual returns are used rather than the expected value. This is because expected returns are not easily predicted with accuracy. The CAPM's constraint of the alpha value to zero, by assuming market is efficient, has been criticised by Jensen (1968), as CAPM does not allow for superior manager's forecasting ability. The Jensen model is formulated as the difference between the return of the portfolio and the return of the benchmark portfolio. It is:

$$(R_{j,t} - R_{ft}) = \alpha_j + \beta_j [R_{mt} - R_{ft}] + \varepsilon_j$$

Where:

R_{jt} = The portfolio return at time t,
R_{ft} = The risk free asset's return at time,
β_j = The systematic risk of portfolio p, to be estimated using regression analysis,
R_{mt} = The return of the market portfolio at time t,
α_j = Jensen's measure of portfolio performance,
ε_j = The error term at time t.

A positive Jensen alpha (α_j) indicates that fund managers have forecasting ability. It is only meaningful if it is used to compare two portfolios that have similar betas. In addition, the adjusted Jensen's alpha is also calculated after adjusting for systematic risk (measured as α_j divided by β_j). Jensen's model may show that a certain portfolio has a large positive alpha and, thus, conclude that it is performing well. A negative alpha represents the portfolio's performance is below its benchmark. This model is commonly used in performance measures due to its simplicity in calculation and interpretation. In addition, Jensen's measure has also been criticised for its one-factor determinant of returns. Fama and French (1993) rectified this problem.

Multi-factor Model

Extending Jensen's model, Fama and French (1993) proposed the three-factor model, with the firm size and the book-to-market ratio added into the model. Sample stocks in their model were first ranked in order of size and then split into the Small and Big groups, with the median size as a benchmark. The book-to-market ratio of these stocks were also ranked and split into High (30%), Medium (40%) and Low (30%). Next, six weighted portfolio groups were constructed: SL, SM, SH, BL, BM and BH. The SML variable was calculated as the average of the SL, SM and SH (small cap); minus the average of the BL, BM and BH (big cap). The HML is calculated as the average of the SH and BH (high book-to-market ratio) minus the average of the SL and BL (low book-to-market ratio). Fama and French's (1993) three-factor model is:

$$(R_{pt} - R_{ft}) = \alpha_p + \beta_{op}[R_{mt} - R_{ft}] + \beta_{1p} SMB_t + \beta_{2p} HML_t + \varepsilon_j$$

Where:

SMB = The difference in returns between the small cap and the large cap portfolio.

HML = The difference in returns between the high book-to-market and low book-to-market portfolio.

Extending from Fama and French's (1993) model, Carhart (1997) proposed a four-factor model by adding the momentum variable. Carhart highlighted that the good performing stocks tend to perform well in the next period, while the poor performing stocks continue to perform badly in the next period. Fund managers who make use of this phenomenon to invest will add value to the portfolio. Carhart's (1997) four-factor model is as follows:

$$(R_{pt} - R_{ft}) = \alpha_p + \beta_{op}[R_{mt} - R_{ft}] + \beta_{1p} SMB_t + \beta_{2p} HML_t + \beta_{3p} PR1YR + \varepsilon_j$$

Where:

PR1YR = The difference between the portfolio return of a past winner and the portfolio return of a past loser.

There is no one superior security or funds performance measurement method. The choice of method depends on whether the fund is part of a diversified portfolio or whether it is the only fund held by the investor. If the fund is held in an undiversified portfolio, then the Sharpe Ratio and Jensen Alpha are more suitable. For all the methods, if a well-diversified portfolio is examined, the rankings should be very similar (Grinblatt and Titman, 1992).

3.2.4 Efficient Market Hypothesis

The efficient market hypothesis is associated with the idea of the Random Walk Theory, which was established by Kendall (1953), in which the data behaves like a wandering series. This theory became the base of the later Market Efficiency Theory. The concept of the random walk is that information is immediately reflected in stock prices. Today's price move is not reflected in tomorrow's price change, only tomorrow's news is reflected in tomorrow's price changes. Since news is not predictable, the resulting price change is random. The concept of an efficient market was first developed by Fama, in 1965, in his PhD thesis (Fama, 1965). In 1970, he rewrote his thesis into a well grounded paper named as Efficient Capital Markets: A Review of Theory and Empirical Work (Fama, 1970). The Efficient Markets Hypothesis states that in an efficient market, prices reflect all available information and, thus, stock prices should follow a random walk. The positive abnormal return earned by investors can only arise by chance. The existence of investors who are able to make abnormal gains from the market indicates that the market is not entirely informational efficient. Hence, the question discussed here is why the mutual funds industry has grown so fast when no one is able to beat the market, including the professional portfolio managers. Studies in developed countries documented strong support for the existence of the Efficient Market Hypothesis (Fama, Fisher, Jensen, Roll, 1969; Fama, 1970; and Jensen, 1968).

The economic condition that leads to market efficiency is that investors have to be rational. EMH states that no fund manager can consistently outperform the market after taking risk into account. In the classic paper, Jensen (1968) documented that mutual funds portfolio underperformed the passively managed portfolio after netting off the operating expenses, management fees and brokerage commission. Jensen commented that resources spent in actively managing a portfolio do not help to earn a higher return for the portfolio than those portfolios that are generated randomly. This evidence supports the strong form of Efficient Market Hypothesis (EMH), which states that the current share prices fully reflect all securities information. Hence, analyzing the past information is no good for forecasting future returns. Jensen's study was re-examined by Mains (1977). With the use of the same dataset, Mains (1977) found positive net annual returns, rather than negative as documented by Jensen (1968). Main's result rejected the strong form EMH and mutual funds' security selection and market timing activities should not be abandoned for the passive portfolio management strategy.

As the basic idea behind EMH was that security prices fully reflect all available information, it makes us question the worth of paying the high fund fees. If the market prices reaction to new information is instantaneous and unbiased, then the market is efficient. It is the information that is quickly and efficiently incorporated into asset prices at any point in time, so that past information cannot be used to predict future price. The EMH implies that it is no use studying the past price behaviour of a rational investor when making investment decisions. Fama (1970) observed that deviations of the market price from its intrinsic value of the investment are possible as long as they are random. This means that the deviation from true values give lucky investors an opportunity to perform better than the market while other investors perform worse than

the market. Ultimately, both effects offset one another. Fama also admitted the existence of irrational investors, however, the rational professional investors act as the arbitrageurs, who will be very happy to smooth the stock price immediately.

In Jensen's (1968) article, he commented that EMH is valid in its strong form. Thus, mutual fund investors cannot rely on private or public information to beat the market, however, Mains (1977) proved that such an argument is not true. The implication of EMH is that individual, professional analysts and investment funds cannot outsmart the market return. Then, what is the role played by the investment fund managers in the financial market? The challenge to the investment fund managers is that all the investment strategies will be seen as irrational due to EMH. The Theory of Random Walk emphasises that the past behaviour of security prices has no use in predicting its future prices. This implies that it is not easy to identify securities that are not correctly priced. However, Sharpe (1966) commented that the task of mutual funds evaluation is the security analysis and portfolio analysis, in which even the Efficient Market Theory holds. The evaluation is in terms of assessment of the extent to which securities returns are correlated and the selection of portfolio of the wanted risk.

Mutual fund returns can be expected to vary due to its different risk classes. The portfolio of some funds may be more efficient than others when managers are able to diversify successfully, thus, yielding more returns for a given risk level. However, the performance of the fund is unlikely to persist.

Carhart (1997) showed that there is some persistence in performance, however, after controlling for Carhart's four-factors, the average net of fee returns of funds becomes zero or even negative; most of the persistence can be explained by the fund's loading on

the four-factors. The reason for persistence in inferior fund performance is the large amount spent on the continual search for incorrectly priced securities by fund managers. In general, evaluating the existence and persistence of mutual funds managerial performance is a vital test of the Efficient Market Hypothesis. Evidence of performance persistence would support the rejection of a semi-strong form of efficient market. The proponents of the Efficient Market Hypothesis argue that the persistence merely arises from luck and is not due to the managers' skill. An average fund manager should underperform the market by the amount of fees charged and the trading cost incurred. Therefore, if this is the case, investors should prefer a passive index fund to an actively managed fund. However, the market of actively managed funds does exist and, in fact, its size is growing from year to year. Investors do trust the actively managed unit trust funds. Perhaps this could be explained by the behavioural aspect of irrational investors. The magnitude and persistence of these returns imply something other than luck as the explanation for this phenomenon.

Some market anomalies are not explained by the EMH – the U.S. and the European market crash in 1987, the Asian financial crisis in 1997, the U.S. economic crisis in 2008, which starting with the collapse of Lehman Brothers and the Flash Crash on 6 May 2010 where the Dow Jones Industrial Average experienced a sudden decline of 1,000 points in a day. No definite conclusion has been reached for the reasons behind the world market crashes. This is where the herding behaviour and psychological feedback come in to explain these stock market crashes. EMH assumes that all investors take into account all available information and that they are rational. The irrational investment decisions are not common and, thus, a small amount of arbitrage opportunity can exist. As these market anomalies are not explained in the EMH, the Theory of Behavioural Finance is introduced.

3.2.5 Behavioural Theory of Finance

Many financial economists and statisticians began to challenge the EMH at the beginning of the twenty-first century. The pioneer psychologists were Kahneman, Tversky and Festinger (Festinger *et al.*, 1956; Kahneman and Tversky, 1979). They believed that stock prices are partially predictable based on the patterns of past stock price and some fundamental valuation basis. Behavioural finance attempted to predict the implication of psychological decision processes on the financial market. It relates market phenomena to individual behaviour. Many behavioural finance theories are competing trying to best explain a large set of findings. Behavioural finance combines psychology, finance and economics into the study of human perception in the decision making process. It is a field attempting to explain the financial market anomalies. Behavioural finance sets a challenge to the conventional thought that markets are always efficient, investors act rationally and without bias. Investors may be capable of effective marketing information search, their personality, cognition and emotion and the human and social factors will eventually influence their final decision.

Behavioural finance contributed to the fundamental work done by Markowitz (1952), Fama (1970), Sharpe (1964), and other proponents of classical economic literature that people are rational. Behavioural finance examines and relaxes the idealistic behavioural assumptions and makes it more sensible. More individual views of the decision making in financial markets are included. Some aspects of the financial market cannot be fully understood without the existence of behavioural finance. Behavioural finance concludes that most decisions are made irrationally due to the fear of losing. It also contradicts the Efficient Market Hypothesis in terms of arbitrage because arbitrage is too risky for investors. The imperfections in financial markets are recognized as a combination of

cognitive biases such as representative bias, overconfidence, information bias, overreaction, and some other individual errors in logical thinking and analysis as well as information processing.

The key concepts in the behavioural finance, such as Prospect Theory (loss aversion, mental accounting, regret), and Heuristics Theory (representativeness, herd behaviour, anchoring, overconfidence, over and under reaction), have been established as contributing to irrational and often harmful financial decision making.

3.2.5.1 Prospect Theory

Kahneman and Tversky (1979) proposed the Prospect Theory suggesting that people assess gains and losses differently and that they value gains more than losses, which is known as the certainty effect. If one were given two equal choices, with a possible gain option and a possible loss option, their decision would be based on the perceived gain rather than the loss even when both options yield similar economic outcome.

Kahneman and Tversky (1979) presented a survey and provided evidence for irrational behaviour. They found that majority of the subjects preferred the sure gain option and avoided a sure loss at all cost. This indicates that people are risk adverse. They are willing to settle for a reasonable level of gains, but are unwilling to engage in risk-seeking behaviours where losses can be limited. Kahneman and Tversky established the asymmetric value function, which is different from the utility function in the reference point. As a measure of target level of wealth, the reference point is determined by each individual. This function is a representation of the difference in utility. It represents the quantity of pain or joy achieved from any gain or loss made. The preference of a particular outcome is due to the irrational behaviour of investors. Prospect Theory and

Utility Theory are two decisions process models to predict how human make decisions. Utility Theory postulates that decisions are dependent on the utility of the outcome of the decision process. Prospect Theory shows that the outcome of decision-making under gains and losses conditions is not symmetrical and sometimes these are irrational decisions. The theory suggests that people evaluate a prospect on gain and losses rather than on final assets. They view gains and losses separately. The disposition effect (investors hold winning stocks too long and sell losing stocks too early) is explained under the loss aversion in the Prospect Theory.

3.2.5.2 Loss Aversion

Loss Aversion is people's tendency to avoid losses rather than to acquire gain. Past studies proposed that losses were as much as twice as psychologically powerful as gains (Kahneman and Tversky, 1979). Losing one dollar is twice as painful as the joy of gaining one dollar (Kahneman and Tversky, 1991). Loss aversion happens when people are more sensitive to the decrease of their wealth than the increase. It helps to explain the tendency of investors to sell winning stocks too quickly while riding on loss making stocks. Shefrin and Statman (1985) described this as the disposition effect. Investors have an aversion to incurring losses much more than the gain that they enjoy. Investors are eager to sell stocks that have gained in value and hold onto stocks for which the value has gone down. Thus, avoiding regret and seeking pride affects human behaviour.

3.2.5.3 Regret Theory

The Regret Theory is a theory that relates to the tendency of people to feel the pain of regret for errors that they have made. Thus, because of the fear of regret, people change their behaviour and become irrational, which makes investors either risk averse or seek risks. Cognitive dissonance is a mental conflict that leads to an uncomfortable feeling

when their belief is wrong. It is the regret over mistakes belief. People then change their attitudes, beliefs, and actions and behave irrationally. Aesop's fable of The Sour Grapes And The Fox explains that people longing for something but find it unachievable, reduce their dissonance by condemning it. This theory of regret leads to evidence found in the mutual funds flow and performance research that money flowing into mutual funds that perform well is much more than the money flowing out of the bad performing funds.

According to Goetzmann and Pele (1997), investors that have made wrong decisions and have invested in losing stocks are unwilling to admit their error and, thus, hold on to them. This leads to the positive convex relationship between mutual fund flows and past performance, which has been well documented (e.g., Chevalier and Ellison, 1997; Sirri and Tufano, 1998; DelGuercio and Tkac, 2002; Nanda *et al.,* 2004; and Barber, Odean, and Zheng, 2005).

3.2.5.4 Heuristics Theory

Heuristics are a trial and error way of solving problems; conversely, 'judgment' signifies assessment. Heuristics are a sophisticated guess, an insightful judgment or just common sense decision which we use to breakdown a complex problem to some simplistic concepts. Trial and error commonly leads to the establishment of a rule-of-thumb, however, it also leads to other errors according to Shefrin (2002). There are two types of heuristics, the availability heuristics and representative heuristics. Both developed by Kahneman and Tversky (1973).

Representative

Representativeness is a common type of heuristic. The Representative Heuristic Theory states that individuals tend to categorise familiar events and group them together if they perceive that the recent event is representative of past events. There is a danger as certain information is used to make assumptions about a wider problem. However, due to lack of information, one may resort to decision making based on this representative information.

As documented by Barber, Odean and Zheng (2005), the investors' representative heuristic induces overly optimistic decisions resulting in mutual fund investors making their investment decisions based on a fund's past superior performance. Representativeness is the use of a psychological term to describe the use of stereotypes. Individuals tend to be overly optimistic about the future performance of past winners and overly pessimistic about past losers.

3.2.5.5 Overconfidence

Overconfidence is a behaviour that people tend to overestimate their knowledge and to underreact to new information. This will lead to investors making a wrong guess as they do not realize that they are at an informational disadvantage; they also tend to trade more frequently.

In a psychological research, Odean (1998) claimed that an investor who is confident will underestimate risk. Subsequently, Barber and Odean (2001) found that men are more overconfident than women in financial decisions. Men trade 45 per cent more actively than women. Moreover, psychology literature also documented that portfolios of men under-performed the portfolios of women as investors, which means that more trades have lower returns than investors who trade less frequently.

3.2.5.6 Overreaction and Underreaction

Kahneman and Tversky (1982) postulated that a representative investor, who never knows the exact outcome, tends to overreact to recent evidence. De Bondt and Thaler (1985) examined whether markets overreact and found that loss making portfolios always outperformed the market index, while the winning portfolio underperformed the index. The authors identified a pattern that the previous extreme winners tend to be undervalued and then became losers, while previous extreme losers tend to be overvalued and subsequently became winners. This is due to the overreaction of investors. Investors overreacted to bad news in the losing case and stock prices tumble down. Investors realized that these losers were underpriced and they begin to rebound after some time.

3.2.5.7 Herd Behaviour

Herd behaviour illustrates how individuals in a group can act together without any plan. The reasons that herd behaviour occurs could be the result of social pressure of consistency, as humans generally desire to be accepted by a group, thus, one way is by keeping to the group's decision. People usually trust friends, relatives, and colleagues more than they trust the media (Shiller and Pound, 1986). Furthermore, individuals believe that it is impossible that a large group judgment could be wrong. As such, even when individuals are persuaded that the strategy is irrational or incorrect, one still follows the herd, trusting that the group knows something that he does not. This is a rational behaviour as it is documented that when a large group of people have similar judgments, they are certainly right (Shiller, 2000). However, this herd like behaviour, even if it is individually rational, creates group behaviour that is irrational and causes fluctuations in the market (De Long *et al.*, 1986).

3.3 EMPIRICAL EVIDENCE

The following are some reviews of past empirical studies that relates to unit trust research.

3.3.1 Research on Fund Family Strategies

Practically, all unit trust funds are managed by a management company. All those funds under the same management company are called "fund families". Therefore, in this sense, all unit trusts are associated with a fund family if unit trust funds are managed and operated by fund families; therefore, the mutual funds issue should be examined at the fund family level. Fund families provide certain advantages such as possible economies of scale and scope from sharing of research resources and information, and lower marketing and distribution costs, which will reduce fund expenses. The larger the company, the more benefits the company will obtain. In addition, they also do better in asset management due to the reason that large families have larger pools of managerial resources, distribution channels and more research is carried out. A fund family has its own goals to achieve, for example, to maximise the profits generated from funds in the family. Thus, a fund family may take on different strategies to attract investment. Dowen and Mann (2007), and Malhotra and McLeod (1997) concluded that larger families enjoy economies of scale and, thus, lower the expense ratio and perform better. This was because families learn from experience and they operate more efficiently over time.

Several studies examined the behaviour and strategies of such fund families (Khorana and Servaes, 1999; Zhao, 2004; Massa 2003; Guedj and Papastaikoudi, 2004; and Gasper, Massa and Matos, 2006) and a few analysed the importance of family

membership on the mutual funds Elton *et al.* (2007). Jain and Wu (2000) provided evidence that fund families that advertise in the magazine attract significantly large cash flows compared to others that did not; even though they did not earn superior returns. They also showed that the results do not support the signalling hypothesis, that is, fund families did not advertise to signal the funds' past superior performance.

Khorana and Servaes (1999) provided evidence that families open new funds when the potential to generate additional income is substantial. Fund families try to provide more choices to existing investors and families also start new funds in strategies in which they already have some existing good-performing funds.

Ippolito (1992), Sirri and Tufano (1998), Nanda *et al.* (2004), and Zhao (2004) found that families were often successful in drawing new cash flows, although many of their current funds were bad performers. Families tend to attract assets to all funds they offer as long as they have at least one top-performing fund. Nanda *et al.* (2004) proved that families try to generate a star fund by increasing the number of funds in the family; which lowers the cross fund return correlation. The authors concluded that such a strategy is harmful to the return in the subsequent period and it would not benefit the investors. Higher risk fund families underperformed their lower risk counterparts, indicating that increasing return variability raised the probability of generating a star would result in poorer performance.

On the other hand, the risk impact on mutual fund investors which arises from fund family's membership was investigated by Elton *et al.* (2007) who addressed the impact of risk associated with restricting mutual fund investments to a single fund family. Using monthly funds returns from January 1998 to December 2002, they examined the

mutual fund family's impact on investor risk. They found that funds with the same objective were more closely correlated within the fund families than between other fund families and that the higher correlation supported all the ICDI categories. This increased correlation was due to the tendency of funds within a family to hold similar stocks and have similar exposure to total risk factors. In order to justify the investment of funds within a family, an extra 50 to 70 basis points in return is needed to maintain the same Shape Ratio as investment of funds outside the family. Thus, they postulated that confining investment to one fund family leads to a greater total portfolio risk than diversifying across different families. They attributed the increased correlation to the common stockholdings in funds within the family. The authors showed that the common stockholdings explained approximately 50 per cent of the increased correlation of within family funds.

Massa (2003), Guedj and Papastaikoudi (2004) and Gasper, Massa and Matos (2006) studied how families transferred performance between funds within the family. They documented that mutual fund families transferred resources across member funds within the family to favour those funds that were likely to increase the overall family values.

Guedj and Papastaikoudi (2004) documented that families that concentrated on their core abilities tended to perform better than families that did not; while Massa (2003) suggested that fees in mutual fund families could be lowered with many differentiated funds being offered, and, due to a wide range of funds offered, investors have a variety of choice to invest in. The author argued that the industry structure of mutual funds affected the fund performance and documented some statistically strong evidence. Massa explained that when the number of funds increases, the degree of market segmentation also increases with funds differentiated into different market categories.

This resulted in poor fund performance as segmentation reduced the scope and range of activity of the manager, thereby slowing down the manager's market timing ability. Thus, funds belonging to large families attract capital within shorter time horizons and also attract investors who prefer a regular turnover. He concluded that fund families with high product differentiations were likely to set up new funds or enter into new categories.

Using the top 50 largest fund families in the U.S. from 1991 to 2001, Gasper *et al.* (2006) investigated whether mutual fund families strategically transfer performance across funds in the family to favour certain funds that are expected to increase the profits of the overall family and to the high value funds (high performance, high fees and young). The strategies employed by families are through the allocation of underpriced Initial Public Offer and opposite trading across funds in the family. Strong evidence was found. The cross-subsidization evidence was obvious when the low value funds style was performing relatively better. Large families commonly manage many funds and the funds that families managed were different in terms of size. The profit earned in mutual fund families is a direct function of fees charged and the assets under management. Hence, certain funds exhibit higher value for the family than others. This explains the reason for cross-subsidisation strategies being engaged in fund families.

The spillover effects were recorded by Massa (1998), Sirri and Tufano (1998), Zhao (2004), Nanda *et al.* (2004), Huij and Verbeek (2007). Gallaher, Kaniel, and Starks (2005) examined the fund families advertising decisions; while Mamaysky and Spiegel (2002), Siggelkow (2003), and Khorana and Servaes (2005) explored their product policies.

Massa (1998) examined the strategies employed by the fund managing companies in terms of market segmentation and fund proliferation. He highlighted that the good management of one fund could lead to the creation of other funds in the family within the same family, named as fund proliferation. This strategy can mask poorly performing funds. Investors are given choices to switch to other funds in the same category with low cost. Massa explained why there were so many mutual funds and why the industry segments itself into an ever-increasing number of categories and concluded that there was a positive spillover effect from star funds to all other funds in the family.

Sirri and Tufano (1998) conjectured that funds are commonly part of a large complex and the membership in a large complex is a significant factor of fund flow, which has an impact on the decisions made by individual investors. They found some performance spillover effects, which they also named the Halo-Effect, which is related to the media effect. If a fund performs well, it makes both itself and the family it belongs to visible to the investors and, thus, increases the capital flows for other funds in the same fund family. In addition, evidence that investors are drawn to large fund families is documented. The authors concluded that selling funds through large complexes and established brand names is beneficial.

Employing all bond and equity funds in the U.S. from quarter one of 1992 to quarter three of 2001, Zhao (2004) examined the motives of fund families in closing superior performance funds. Funds with larger size, better returns and greater inflows were more likely to be closed. Zhao found no evidence that closing the star funds was to protect the fund's good performance, which was the reason given by the fund families when they closed a fund. Rather, he found evidence that the closing strategy led to higher inflows of capital into other funds in the family by running a fixed effect panel regression on

both the quarterly and annually data. The author concluded that this was a strategy employed by the fund families to create a spillover effect and it was more apparent in large fund families because more funds would benefit from this effect. The reason that fund families closed a star fund is to signal its superior performance and to attract flows into other funds in the family as a result of the spillover effect.

Khorana and Servaes (2005) highlighted the benefits of increasing the number of funds offered in a fund family. They studied the determinants of market share in the mutual fund industry and found that the market share of funds could be increased by a change of fee structure or by product differentiation. Specifically, these families improve performance. Fund families who introduced more funds relative to their competitors are effective in boosting market share.

Using more than 16,000 mutual funds from the CRSP database for the periods of 1992 to 1998, Nanda *et al.* (2004) modelled the spillover effect of star and dog funds on investment flows into a fund family to examine the impact of family structure on fund strategy. The author found that star performance generated greater money inflows to the fund itself and to other funds in the same family. They proposed that underperforming fund families were likely to engage in star-making strategy in order to enjoy the potential spillover effect.

However, Gallaher, Kaniel and Starks (2005) examined the response of fund flows into a fund family on the family's strategic decisions, and found that the advertising effect on fund flows was not related to the performance effect. Past returns are shown to be a significant predictor of future family flows on a monthly basis. The relationship between the level of advertising and family fund flows was positive and significant.

However, no significant relation existed between the past one-year returns and the advertising expenditure; even the relation between the advertising expenditure and the expense ratio is significant.

Using the data of the U.S. equity fund over the period of 1992 to 2003, Huij and Verbeek (2007) investigated the impact of mutual fund marketing and distribution on funds in families. They found that funds with large marketing expenses attract substantially larger inflows in response to their performance. They found evidence of cross-subsidization of funds with low marketing expenses by funds with high marketing expenses in a family. This was a spillover effect due to favouritism towards particular funds in terms of marketing cost apportionment. This means that high-marketing funds in a family create spillovers or help to increase inflows to other low-marketing funds in the same family. Funds with low marketing costs are directly subsidised by family members with high marketing costs. The authors concluded that fund families that favour certain funds would cross-subsidise these funds through marketing expenses allocation. This suggests the agency problem between the investors and the fund families and that this is exacerbated by the competition in the mutual fund industry.

As it is well written in literature (Ippolito, 1992; Gruber, 1996; Goetzmann and Peles, 1997; Chevalier and Ellison, 1997 and Sirri and Tufano, 1998), investors tend to react asymmetrically to fund performance. Well-performing funds attract much higher money inflows as compared to low outflows of money in poor performing funds. This convex relationship implies that assets under management of a family is expected to be larger if it produces one star fund and some poorly performing funds than if it has a few average performing funds. This effect induces the family strategy of star fund generating.

Other fund family related studies include Kempf and Ruenzi (2007), Yates (2007) and Kempf and Ruenzi (2008). Kempf and Ruenzi (2007) studied the behaviour of individual fund managers within fund families and the intra-firms competition. They discovered that fund managers compete with other fund managers in the same management company for better ranking in the fund family. This was more severe in large families than in the small. However, they showed that teams in large families engaged in less competition.

Yates (2007) examined the effect of fund family membership on investor choice and whether there is any significant difference in the response of individual fund flows to past performance for funds belonging to families with a better reputation. In this study, family reputation was proxied by family size and family age. He hypothesized that the reputation of mutual fund families was an important determinant in individual investor's fund selection decisions. They found that fund flows were significantly less sensitive to past returns for funds that belong to large or older families.

Kempf and Ruenzi (2008), analysed U.S. equity funds from 1993 to 2001, and showed that the relative position of funds within the family was an important determinant on fund inflows. This influence was stronger than the influence of the position within the segment. They documented a great difference in fund inflows between funds that were ranked on the top and those that were not. In addition, their analysis also showed that this additional influence strongly depends on the size of the fund family. In addition, they confirmed the convex relationship between the relative position of funds in a family and its following inflows.

Ciccotello *et al.* (2006) showed that focused families tend to outperform their peers and high search cost investors would prefer to invest in unfocused families (the fund families that offer a broad product range); whilst it was better for low search cost investors to invest their capital across families focused in a specific product line. Fund families that offer a wide range of products in fact aim at the investors with a high level of personal administrative and search costs as per Sirri and Tufano (1998); Massa (2003). By offering funds across many asset types, unfocused families could offer the so-called one-stop-shopping to investors, which would lower search costs for investors.

The non-U.S. studies on fund families include Cheng, Pi and Wort (1999) (Hong Kong); Korkeamaki, Puttonen and Smythe (2007) (Finland).

Cheng *et al*. (1999) examined mutual fund houses in Hong Kong, using the equity funds' monthly returns 1986 to 1995. They found that 2 out of 32 fund houses showed hot-hand persistency, especially by the repeat winners. There was no evidence of loser persistency among the fund houses on the monthly return. On the individual fund performance level, they found that only 4 out of 177 funds exhibited hot-hand behaviour. In addition, hot-hand houses consisted of more winner funds and that short term persistence of good performing funds existed, which may be due to the common managers' strategies. Korkeamaki, Puttonen and Smythe (2007) examined the advertising effect on mutual fund flows in the Finland fund market. They ran an unbalanced random effect panel data regression on the 145 Finland families over the 8-year period of 1999 to 2004. The random effect model is used because not all the Finland families in the fund market were included in the study. The following variables are included as the independent variable in the model, the dummy of the top 10 percentile rank, fund size, lag flows, return standard deviation and fund expense ratio.

Analysing the amount spent on advertising and media, the authors observed that the advertising activity in fund family with some superior performing funds lead to greater money inflows. In addition, fund families that aim at large investors experience significantly smaller flows.

3.3.2 Research on Portfolio Diversification

Diversification is a process where risk is spread over a portfolio of securities in different sectors, companies, or countries. Statman (1987) showed that investing in a well-diversified portfolio of 30 to 40 stocks will yield the most cost-effective level of risk reduction. However, Evan and Stephen (1968) demonstrated that diversification can be achieved when holding 10 to 20 stocks in portfolio. Fisher and Lorie (1970), using New York Stock Exchange companies over 1926 to 1965, supported Evan and Stephen (1968) result and showed that 8 stocks held in a portfolio reduce the risk of portfolio by 80 per cent. Elton and Gruber (1977) documented that by increasing the number of stocks in a portfolio from 15 to 100, a substantial amount of non-market risk can be eliminated. Tole (1982) commented that 25 to 40 stocks are sufficient for risk reduction. De Wit (1998) argued that adding stocks to a large portfolio is still able to reduce significant diversifiable risk. He pointed out that the required return of a portfolio fell by 6 to 21 basis points when 100 stocks were increased to 500; and an optimal portfolio can be achieved with 481 stocks. The change in the number of stocks in a portfolio is strongly related to the levels of new investment and redemptions, the funds flows, but not the fund size changes due to the fund returns (Shawky and Smith, 2005).

Based on the above discussions it seems that an individual investor needs to have a portfolio of 20 to 100 stocks for a fairly well-diversified portfolio. For an average investor, who is constrained by both time and money, this is a very tall order. Unit trusts

present an opportunity for small investors to be well diversified. Investing in unit trusts allows investors to enjoy the advantage of increased diversification. Small investors are able to access diversified portfolios of assets and are professionally managed; which is impossible to create with a limited amount of capital. There are two types of diversification, horizontal and vertical diversification. In vertical diversification, investors spread their capital between different types of assets such as equity, bonds, government bonds, corporate bonds, cash, and property. Horizontal diversification is when investors hold different classes instead of the same asset class. Here, in order to reduce the specific risk, investors invest in assets in different sectors, funds managed by different management companies or even in foreign funds or international funds (Errunza, Hogan and Hung, 1999; Abdullah, Medewitz and Olson, 1994). In this study, the horizontal diversification is examined, that is, the unit trust investor investment diversification across different unit trusts management companies.

Zainal *et al.* (2004) provided some evidence that international diversified portfolio performs better than the local diversified portfolios. However, this trend shows the reverse during crisis periods, changing with the economic condition. The authors emphasized that the most important factor for the good performance of domestic-based portfolio is the correlation among stocks in the portfolio and also provided evidence that Bursa Malaysia Stock Exchange is rich in shares that are poorly correlated to each other. Fund management companies should exploit this opportunity to include stocks, which are poorly correlated into their individual fund to reduce the total portfolio risk; otherwise, investors should invest in funds across management companies for risk reduction. However, Ang and Chen (2002), and Butler and Joaquin (2001) showed that international stock markets have higher correlation during bear markets than during bull markets.

In general, risk reduction through diversification can be achieved by the inclusion of securities with low correlation into the portfolio. The previous studies documented that the optimum portfolio size to achieve risk reduction benefits range from 20 to 500 securities. However, the optimum number of securities to be included in a portfolio without incurring unnecessarily marginal cost is still uncertain.

3.3.3 Research on Unit Trust Performance

Unit trusts investment has been growing tremendously in the developed market and the emerging market. The evaluation of fund performance is part of the investment management process, which would feedback to investors for decision making purposes. This issue of performance assessment or to examine whether fund managers are able to add value for the investors is closely related to the market efficiency. The funds excess returns become an interest for the proponents and opponents of the Efficient Market Theory.

Beginning with Sharpe (1966), Treynor and Mazuy (1966), Jensen (1968), and Fletcher (1995), researchers have studied the performance of different groups of unit trusts using different methods. Other researchers, such as Malkiel (1995) and Carhart (1997) also found evidence that support the EMH Theory. Attempting to identify the investment managers' skill in predicting the future security prices and the market movement, suggested that managers did not out-perform the market, especially over a long time. The outperformance over a lengthened period is merely luck (e.g., Treynor and Muzuy, 1966; and Jensen, 1968). However, this conclusion is challenged by some other researchers, such as Carlson (1970), Mains (1977), Ippolito (1989), Grintblatt and Titmann (1989, 1992), Hendrick *et al.* (1993), Volkman and Wohar (1995), Lu Zheng

(1999), Wermers (2000) who showed that actively managed funds outperform the market. In general, researchers have inconclusive evidence in studying the mutual funds performance.

Most of the studies of fund performance are carried out in developed countries. In general, the findings showed that mutual funds are not able to outperform the market. This underperformance is due to the high fees and expenses incurred in fund management, rather than being due to the inferior manager performance. The performance of funds is found to be sensitive to the performance measurement model, the benchmark and the data used.

In the classic study, Treynor (1965) provided a conceptual framework for mutual funds performance evaluation. A performance measure is developed that relates the expected return of a fund to the benchmark return. Using the same framework, Sharpe (1966) examined 34 open-ended mutual funds for the period 1954 to 1963 and showed that performance can be evaluated using a simple measurement. He also documented that the Sharpe ratio calculated varies from 0.43 to 0.78; he attributed the variation to high fund expense or difference in management skills. Subsequently, Jensen (1968) examined 115 mutual fund returns from 1954 to 1964 using S&P 500 index as the benchmark. He found funds earned 1.1 per cent below the expected return with the given systematic risk level, after deducting fees and expenses. Jensen (1968) derived a risk-adjusted measure of portfolio performance, known as the Jensen's alpha to determine the magnitude of manager's forecasting ability, which contributes to the fund returns. With the aid of the single-factor CAPM, the author provided evidence that on average the 115 U.S. mutual funds in his sample from 1945 to 1964 were not able to

outperform the buy-and-hold investment strategy. Hence, he concluded that an individual fund was not able to significantly outperform mere random chance.

However, Roll (1977), Grinblatt and Titman (1993), Grinblatt and Titman (1994) critically assessed the performance assessment methods and found that the tests of market performance are sensitive to the choice of benchmark. Roll (1977) vigorously criticised the use of the CAPM as a benchmark in performance assessment. He commented that the abnormal return obtained is a result of an inefficient market proxy. Lehmann and Modest (1987) addressed the issue of the choice of benchmark portfolio in measuring the mutual fund performance and they reported some persistency in mutual funds alpha. They also found that the performance of mutual funds underperform the market index in the U.S. financial market. Using various performance measures such as Treynor and Black's (1973) appraisal ratios and alphas in the CAPM model etc., they examined the persistence of fund rankings. This is the first study where multifactor models are used in the performance measurement. The authors established that performance persistence of funds is very much dependent on the performance measures used. Different measures give different fund performance rankings. In addition, the author also emphasised that it is important to identify a set of benchmarks that represents the general determinants of fund returns.

Some studies provided evidence of positive returns (Grinblatt and Titman, 1989; Ippolito, 1989; Grinblatt and Titman, 1992), while some documented the underperformance of mutual funds (Malkiel, 1995; Gruber, 1996; Elton, Gruber and Blake, 1996; and Carhart, 1997). In the study of the value-weighted index of equity funds, Brown and Goetzmann (1995), and Carhart (1997) established that the U.S. equity funds outperformed the benchmark. They attributed this effect to some common

factors in stock returns, mutual fund expenses and transaction costs; but not to superior stock picking skills.

Grinblatt and Titman (1989) showed that growth and small funds earn abnormal returns. However, the higher abnormal returns become negative after setting off the funds expenses. Active management generates superior performance funds. Zheng (1999) found that smart investors can outperform average mutual funds. However, this is confined to the case of the positive new money flow of small funds.

Conversely, Carhart (1997) concluded that the findings did not support the existence of skilled fund managers in the monthly risk adjusted returns of 1,892 diversified equity funds over the period of 1962 to 1993. Gruber (1996), using raw returns and the four-index alpha of Elton *et al.* (1996) as the performance measure, analysed 270 mutual funds for the periods of 1985 to 1994. The author found evidence that mutual funds underperform the market when the single index model and four-index model are employed. Generally, actively managed funds show underperformance. The author explained this case as being caused by the existence of two clienteles, the sophisticated, informed investors and the unsophisticated, disadvantaged investors.

In mutual fund performance and market efficiency studies, researchers noted that the empirical results of fund performance may be overstated by the survivorship bias[1]. Elton, Gruber and Blake (1996) did a thorough examination into the survivorship bias issue. Funds that ceased to operate were due to their bad performance. Thus, evaluating the performance of the surviving funds will overestimate the performance of funds.

[1] Survivorship bias in mutual funds research is the tendency to exclude the failed companies from performance studies as these companies had ceased operation. This leads to the results of studies to skew higher. The reason being that only the companies that were successful are able to survive until the end of the period are included.

Grinblatt and Titman (1992) showed the existence of survivorship bias, while earlier studies like Sharpe (1966), Jensen (1968) and Carlson (1970) did not take into account the survivorship bias, which may over predict a fund's superior performance. The majority of the later studies take into account the survivorship bias (Hendricks *et al,*. 1993; Malkiel, 1995; Elton *et al.*,1996; Carhart, Carpenter, Lynch and Musto, 2002). Malkiel (1995) calculated the unadjusted raw return and found that survivorship bias increases mutual funds that survive by 150 basis points. Elton *et al.* (1996) provided an estimate of the amount of survivorship bias of 188 equity funds for the period of 1977 through 1993 and showed that the survivor bias in average fund return increases with the sample periods. Carhart (1997) found that survivor bias weakens persistence measures and, also, non-surviving funds underperform for as long as five years before they vanish. Carhart *et al.* (2002) re-examined the survivor bias using 1,346 surviving funds and 725 non-surviving funds over the periods of 1962 to 1995. They examined from one-year sample to over fifteen-year sample periods and found that the survivor bias increases with the sample length at a decreasing rate.

The performance of funds is also found to be sensitive to the data used. Volkman and Wohar (1995) provided evidence that the investment periods of one, two and three years result in the highest significant fund returns. The author documented performance persistence of funds over time. They attributed this persistence to the ability of fund managers to earn excess returns.

Malkiel's (1995) finding supported the Efficient Market Hypothesis. All equity mutual funds for the period 1971 to 1991 of an evaluation period of one year were studied. It was benchmarked against the Wilshire 5000 Index and the survivorship bias issue was taken into account. The author reported that the alpha value of net returns and gross

returns were not significantly different from zero. Funds performance was found to be persistent in the 70's but not in the 80's. He concluded that the net return of funds underperforms the benchmark portfolio.

Elton *et al.* (1996) provided an estimate of the amount of survivorship bias of 188 equity funds for the period of 1977 through 1993. They showed that the survivor bias for average fund returns increase with the sample periods. They noticed that, in general, there is no evidence that managers can provide superior returns on the portfolios they manage, even though they provide their services at no cost. Evidence of persistence was documented in the one-year and three-year risk adjusted returns.

Another group of researchers also investigated the market timing and claim that, on average, the managers do have selectivity ability, whereas its timing performance is poor. However, Carhart (1997) and Hendriksson (1984) argued that both market timing and selectivity ability are positive. Jain and Wu (2000) concluded that funds attract more assets following the advertising, which means that funds advertise to attract more new money rather than signal superior performance.

Elton *et al.* (2003) examined whether funds with incentive fees have superior stock selection ability funds performance for the period 1990-1999. They used many different benchmarks and the risk-adjusted excess return was calculated using the multi-index model. They showed that alpha and the risk of funds with incentive fees is higher that the non-counterpart. They also found evidence that funds with incentive fees attract more new money flows, which indicates that investors are aware of the better fund performance.

Generally, most of the studies in the literature stated that mutual funds are not able to outperform the market. Some suggested that growth funds perform better than other types of funds. The reason for the poorly performing funds to perform worse than the benchmark was the high cost and expenses incurred in the funds, rather than the inability of the fund manager. It was highlighted that the performance of funds is affected by the performance measures, and the benchmark and data used.

3.3.4 Research on Performance Persistence

Research on performance persistence investigates whether past information on mutual funds performance is useful for investors in making investment decisions. The assessment of performance persistence is also a test on the market efficiency. There should be no evidence of performance persistence if the market is efficient. The fund prices should follow a random walk pattern. The majority of the early studies of fund persistence examined whether mutual funds can systematically pick securities over a certain period of time (Treynor, 1965; Sharpe, 1966; Jensen, 1968; Grinblatt and Titman, 1989; Ippolito, 1989); they either found no existence of persistency or only some weak evidence of performance persistence was obtained. The track record of a fund manager contains no information about future performance. Most of these early studies apply relatively long selection and holding periods. Sharpe (1966) and Jensen (1969) showed that the inferior performance of funds persists over more than ten years. Morey and Matthew (2005) examined the performance persistence of 273 U.S. equity funds for the period of April 1987 to June 2000. Various performance measures had been used in this study, namely, the Morningstar ratings, Sharpe Ratio, Jensen Alpha, Elton, Gruber and Blake's (1996) four-factor alphas and Carhart's (1997) four-factor alpha. Analysing three-year returns, the authors found no persistence among the funds upgraded for the first time to Morningstar's five-star rating fund.

Carlson (1970) and Lehmann and Modest (1987), Grinblatt and Titman (1989) utilized the analysis periods of five years. Carlson (1970) found only partial performance persistence in his study. He examined 82 equity mutual funds over the period of 1948 to 1967. No performance persistence was found using the ranking of Sharpe ratio ten-year risk adjusted performance, but some weak evidence was detected in the five-year period. The evidence of persistence was weaker in the risk adjusted returns than in the absolute returns. Using various performance measures such as the total returns, the information ratio, and alpha ratio calculated using CAPM model and APT model, Lehmann and Modest (1987) studied the fund performance ranking. There were 130 mutual funds in the sample from 1968 to 1982 for five-year periods. The performance persistence is documented. Grinblatt and Titman (1989) examined 157 stocks funds between the periods of 1974 to 1984, with five-year evaluation periods. They formed Jensen's measure using four sets of benchmark portfolios, which was the monthly equally weighted portfolio using the CRSP securities, the CRSP Value-weighted, the ten-factor portfolio and the eight-factor portfolio benchmark developed based on the factors of dividend yield, firm size and past returns. The eight-factor portfolio benchmark was selected for benchmark evaluation, as it was more appropriate, because the intercepts of the 109 portfolios formed based on securities characteristics and industry grouping were nearest to zero. The other three were used for comparison purposes. Thus, the eight-factor portfolio benchmark was used to reduce the likelihood that passive strategies could have an effect on the results. Their study found partial evidence of fund returns persistence over the five years. They found that some mutual fund managers are able to earn abnormal returns consistently before fees and expenses. Their analysis also showed that actively updated fund portfolios attained significant abnormal returns. The fund portfolios that were updated quarterly outperformed those that were updated annually.

Jensen (1968) examined fund performance persistence over the two ten-year periods from 1945 to 1964 by developing Jensen alpha based on the CAPM measure for funds abnormal returns measurement adjusted for risk. He established no existence of performance persistence. However, the author noted some weak persistence in the inferior funds.

Later studies of mutual funds persistence in the 1990s challenged this conclusion over a one to five year holding period. Other researchers who found evidence of performance persistence in the 1990s with the use of shorter periods in their analysis include Grinblatt and Titman (1992) who investigated performance persistence with five-year periods; Hendrick *et al.* (1993) looked at even shorter periods of two-years, one-year, six-months and three-months; Goetzmann and Ibbotson (1994) studied the sample at two-years and a one-month holding period; Brown and Goetzmann (1995) utilized a one-year holding period in their analysis; and Elton (1996), Elton *et al.* (1996) used a one to three-year period. All these studies documented evidence of mutual fund performance persistence.

Grinblatt and Titman (1992) re-examined the longer term performance persistence of all types of funds, totalling 279, for the period of 1974 to 1984 using the eight-factor portfolio benchmark. The eight-factor portfolio benchmark was constructed to take into account past returns (one portfolio), dividend yield (three portfolios) and account size (four portfolios). They documented that mutual fund performance persists over time. In a study of a five-year period, they found that mutual funds realized 1 per cent abnormal returns and that they were expected to increase by 0.28 per cent in the following five-year period. They concluded that the past performance of funds provides information for investment decision. This finding was explained as the persistence differences in

fees and transaction costs, which is in line with the argument of the ability of fund managers to earn abnormal returns.

However, Hendricks *et al.* (1993) documented that the three-month returns are positively correlated to returns over the previous year. In this study, they used a sample of 165 growth equity funds, which were open-end and no-load, over the period 1974 to 1988. The sample was corrected for survivorship bias. The authors provided evidence that funds that performed well in the most recent one year sustained to be superior in the next year, and that funds that performed inferiorly during the most recent one-year period tended to be inferior in the near future. They named this phenomenon as hot-hands. Their results were claimed to be robust on several potential biases, namely, the benchmark inefficiency, spurious persistence, nonlinearities between fund returns and benchmark returns.

Wermers (2000) analyzed all the funds that existed in the twenty-year period from 1974 to 1994 using the methodology introduced by Daniel, Grinblatt, Titmann and Wermers (1997). He provided significantly strong evidence of one-year performance persistence and concluded the existence of persistence of hot hands in the growth-oriented funds.

Drom and Walker (2001) using a similar dataset as Malkiel (1995) of 151 U.S. equity funds, over a twenty-one year period from 1971 to 1990, with the use of raw returns and Jensen alpha as performance measurement, documented no evidence of long term performance persistence with the ten-year holding period. However, they found short term persistence over a one-year to three-year holding period. The authors postulated that size has an impact on the time period dependency and they found that small-cap

stock funds performed better than the S&P 500 index in the 1970s, but underperformed in the 1980s.

Harlow and Brown (2006) analysed performance persistence of 5,614 U.S. equity funds, over the sample period of 1981 to 2003, for a one-year holding period, within the fund classes and also in the cumulative level. The authors classified the fund universe based on Fama and French's three-factor alpha model (1992). Strong evidence of short term performance persistence was documented in this study during the one-month and three-month holding periods.

Sehgal and Jhanwar (2008), using four-factor abnormal returns, documented stronger short term performance persistence of 59 natural funds from January 2000 to December 2004 in daily data but they found no evidence in monthly data. The authors concluded that the frequency of data indeed influenced the outcome. This result was consistent with Bollen and Busse (2005) who documented short term persistence for portfolios developed on abnormal unadjusted returns.

Zheng (1999) documented that the performance persistence is a short term phenomena, that is, it would not persist for more than one quarter into the future, however, the worst performance persistency had a longer life of up to 30 months.

Elton *et al.* (1996) found evidence of persistence in mutual fund performance of both short term and long term, even after adjusting for risk. They used a four-factor alpha model, with a sample of 188 stock funds, from 1977 through 1993, after controlling for survivorship bias; this confirmed the hot-hands phenomenon by Hendrick *et al.* (1993). Furthermore, they documented that the past performance in a fund can convey

information up to three years into the future. The differences in the risk-adjusted return between the top (0.9 basis points per month) and bottom deciles (-43.7 basis points) were attributed to the difference in the selection skill of the managers and expenses. In their study, they also carried their test with the inclusion of high expenses. Similar results were obtained. This implies that fees and expenses justified only a small amount of difference in funds performance across funds. They concluded that past performance contained information about future performance.

Persistent Losers

Some literature argued that persistence was more apparent in loser funds than the winner funds (Goetzmann and Brown, 1995; and Carhart, 1997).

Goetzmann and Brown (1995), using data of monthly returns for 728 mutual funds over thirteen years, from 1976 through 1988, which was free of the survivorship bias, reported the repeat-winner effect, that the superior performing manager in the past would also be the superior performing manager in future. The authors used various performance measurements, namely, the raw total return, Jensen alpha, information ratio, three-index alpha and the group-adjusted returns. They also found that persistence was more apparent in loser funds than the winner funds. Fund performance persistence can be used as a guide by investors to decide which fund to avoid.

Carhart (1997) used data free of survivorship bias from January 1962 to December 1993, which includes a total of 1,892 U.S. equity funds after omitting the balanced funds, international funds and sector funds. CAPM, three-factor and four-factor alpha models were used to estimate fund performance. Consistent with previous research, he found evidence of performance persistence, but mostly in the loser funds. He provided

evidence that funds in the top deciles earn about 3.5 per cent above the funds in the bottom deciles in one-years time and he explained that this difference is caused by the poor performance of funds in the bottom deciles. The poor performer arises from persistently high expenses, which suggested that fund managers possess little stock selection skill. Carhart concluded that investors should try not to invest in funds that are persistently performing badly and funds with high expense ratios, transaction costs and load fees. Investors should invest in funds with a good return one year before, but not more than the past one year. Investors should use an investment strategy that can acquire the difference in the return between the top and the poorly performing funds. This also showed that performance persistence exists, at least in the short term. Similar to Goetzmann and Brown (1995), he attributed performance persistence to the losing funds that earn negative returns consistently. Carhart concluded that his finding was consistent with market efficiency. After accounting for the momentum effect, the evidence of persistence among mutual funds vanished and no existence of skilled mutual fund portfolio managers was detected. Most underperformance was due to the investment expenses.

Horst and Verbeek (2000) examined 2,678 U.S. growth and income equity funds from year 1989 to 1994 using the Jensen alpha, total returns, and Carhart four-factor alpha to examine fund performance persistence. Short term persistence was found, especially in growth funds using the one-year period, while for the three-year period, evidence of performance persistence was only detected among the poorly performing funds, particularly among the income equity funds but not the good performers.

Other studies of persistence, like Gruber (1996), examined the strength of the persistence of performance rather than its existence. Using the survivorship bias free

data from 1984 to 1995, he predicted both returns and risk-adjusted returns from the four-index model over one-year and four-year intervals and provided evidence that risk-adjusted returns of 0.75 per cent a year would be earned by buying the top deciles funds based on his four-factor alpha. He established that past performance provides even stronger information concerning funds expenses. Gruber developed his theory of sophisticated and unsophisticated investors and suggested that past performance contained information about the future funds performance. The unsophisticated investors were identified as the investors who make their choice based on the information from advertisements or advice from brokers, the institutional disadvantaged investors who were restricted by their plan and the tax disadvantaged investors are those who are not able to direct their money efficiently because of capital gains tax. Gruber had identified that there are flows of new money into and out of mutual funds following the predictors of future performance. The flows of new money are directed by the sophisticated investors. He confirmed the findings of Elton *et al.* (1996).

Survivorship Bias and Misspecification of Benchmark

However, some researchers argued that this performance persistence is a result of either survivor bias (Brown, Goetzmann, Ibbotson, and Ross, 1992; Malkiel, 1995; Brown and Goetzmann, 1995) or misspecification of benchmark (Wermer, 1997).

Brown, Goetzmann, Ibbotson and Ross (1992) studied 150 growth funds from 1976 to 1987 and showed that survivor bias plays an important role in the persistence studies, which can lead to the existence of spurious performance persistence. Even though the real performance persistence did not present in the subsequent period, the superior performance in the previous period would lead to the superior performance to be shown in the subsequent period because the closing of inferior performing funds causes

performance persistence. The authors found that high risk funds tend to achieve more extreme (high or low) portfolio returns as compared to the low risk funds in any period. If those poor performing high risk funds were excluded from the sample due to their non-surviving, then it may be wrongly concluded that high risk funds consistently perform better than other funds.

Grinblatt and Titman (1992) provided an alternative view to Brown, Goetzmann, Ibbotson and Ross on the survivorship bias issue. According to Grinblatt and Titman, if survival depends on longer-term past performance, then the exclusion of non-surviving funds in the persistence test will lead to a biased outcome from not finding the persistence evidence in the results.

Volkman and Wohar (1995) examined the determinants of mutual funds persistence using 332 funds from September 1980 to December 1989 after addressing the survivorship bias and inefficient benchmark problems. They concluded that the three factors that influence fund performance persistence were: the past performance, fund's goal and management fees. Funds with high historical returns, with the goal of maximizing capital gain and low management fees, show significantly positive persistent performance.

Wermers (1997) found evidence of short term performance persistence for 400 to 2,700 funds between the periods of 1975 to 1994. In his study, using simulation sample, he found that surviving funds have an average return of very little higher than the non-surviving funds, similar to the findings in Elton *et al.* (1996) and Carhart (1997). Thus, the survivorship bias is not a major issue in the research of fund performance persistence. He observed that Morningstar were requested to include the one-year

performance ranking, which showed that this information of past performance is useful to investors. He also showed that mutual funds play a role in the momentum effects in stock returns as a result of fund herding investment into stocks based on past performance. Carhart (1997) attributed the persistence to the benchmark error. However, controlling for the Fama-French factor, he showed that no performance persistence exists after more than one year.

Differences in Methodologies

There are three common approaches past researchers have used for assessing persistence: (1) trading strategy portfolio; (2) rank correlation; and (3) the contingency table.

In the trading strategy portfolio, a set of time series portfolios is used to test the persistence of performance. This approach was applied by Hendrick *et al.* (1993); Elton *et al.* (1996) and Carhart (1997). Funds are allocated to each group based on a set of trading rules and a portfolio is formed for each group, with a specified holding period. These portfolios are held until the period and rebalanced. Hendrick *et al.* (1993) found that performance persistence exists over a short term period. Elton *et al.* (1996) documented persistence in the one-year and three-year risk adjusted return. Carhart (1997) documented performance persistence evidence in the poor performance rather than in the well performing funds. This method is criticized for its subjective decision of its trading rule.

In the rank correlation method, the relationship of the fund rankings is examined. This approach was applied by Sharpe (1966); Bogle (1992) and Blake *et al.* (1993), Huij and Verbeek (2007). Sharpe (1966) analysed all 34 funds for two ten-year periods from

1944 to 1953 and from 1954 to 1963. He developed a Sharpe ratio to measure a fund's performance and the funds were then ranked over the two sub-periods and a weak positive correlation was found between the two ranking periods. Sharpe concluded that past performance does not help in predicting future performance. Bogle (1992) found no persistency in either the one-year or ten-year holding period for the equity fund in the sample over 1971 through 1991. Similarly, no persistence was found in the three-year and five-year holding period for the 41 bond funds. Huij and Verbeek (2007) employed the Bayesian approach using Carhart's four-factor alpha as a performance measure on the monthly return data of over 6,400 U.S. equity mutual funds for the period from 1984 to 2003 to investigate mutual fund short-run performance persistence. Based on past performance, they sorted funds into rank portfolios. Funds were then grouped into deciles portfolios based on twelve-month ranking. This method allowed the investors to learn across other funds and, therefore, the consequential belief in managerial skill is not completely subjective. The authors found that funds in the top deciles earned statistically significant abnormal return of 26 basis points in the month immediately after ranking. Moreover, fund persistence changed across investment styles. It is mainly clustered in young, small and growth funds.

The two-by-two contingency table is also commonly used in mutual fund persistence research (Goetzmann and Ibbotson, 1994; Kahn and Rudd, 1995; Brown and Goetzmann, 1995; Malkiel, 1995; and Droms and Walkers, 2006). It is a non-parametric methodology. Funds are classified as either winners or losers with reference to median returns.

Grinblatt and Titmann (1992) conducted the cross section regressions using risk-adjusted returns together with the multiple portfolio benchmarks and found that persistence exists in the superior performance over a five-year period.

Goetzmann and Ibbotson (1994) used a two-by-two contingency table for fund performance grouping. With data for all 728 funds over 13 years from 1976 to 1988, using total returns and Jensen alphas as performance measures, they examined whether good performer repeats and the patterns in the mutual fund return behaviour. The power of various holding periods, three-year, two-year, one-year and one-month were examined. Their paper was the pioneer in the literature that controls for the momentum effect, that is, to differentiate whether the performance persistence was a result of the momentum effect or whether it was due to long term effects that were possibly related to the risk level. They found strong evidence of both positive and negative performance persistence in both relative and absolute returns for the next two to eight quarters. The relative return was computed when the individual fund return was compared with the median fund return of the mutual funds industry while the absolute returns compute the fund abnormal returns after adjusting for risk. The result was similar even after fees and expenses were accounted for. Although the evidence of performance persistence was strong during the 1970s, it was weaker in the 1980s.

Some research used a combination of different methodologies to assess the performance persistence. Allen and Tan (1999) used the contingency tables to categorize funds performance into winners and losers, then, Spearman Rank Correlation Coefficient, Chi-square independence tests and the Ordinary Least Square Regression analysis of CAPM risk adjusted returns were performed. The authors found performance persistence evidence for 131 U.K. managed funds during 1989 to 1995. They found

performance persistence for the one-year and two-year period, but no evidence for the one-month and six-month period. They concluded that past returns and relative ranking provides useful information for future performance prediction and they suggested that hiring an existing top performing manager will help in the portfolio performance in the next period of time.

Causes of Performance Persistence

Kahn and Rudd (1994) focused their analysis on identifying the cause of the performance persistence rather than just examining its existence. They used both the contingency table and regression analysis, which regresses period 2 returns against period 1 returns to analyse the equity and fixed income funds for the period 1983 to 1990. Even after accounting for management fees and style, performance persistence was detected in the fixed income funds.

Brown and Goetzman (1995) examined 829 funds over the period 1976 to 1988 using survivorship bias controlled data and showed that both the good performer and the poor performing funds repeat. They used the contingency tables with a CAPM alpha and three-factor alpha metrics to measure performance persistence on a yearly rolling basis. They demonstrated that persistence exists, but that it was mainly due to funds that lag the index. They also provided evidence that the negative performer in the previous year was a predictor of performance in future, which supports both the viewpoints of Brown, Goetzmann, Ibbotson and Ross (1992), and Grinblatt and Titman (1992). They concluded that investors should avoid the historical loser funds. They added that the time period of study affected the results of persistence study; while the correlation across managers and the underperforming funds have led to the persistence of funds performance. However, they argued that high fees were not the explanation for the

inferior performance. Brown and Goetzman (1995) attributed this persistence to the survivorship bias and misspecification of the benchmark model. They also commented that performance persistence was possibly caused by the common strategies among mutual funds.

Malkiel (1995) analysed 724 equity funds for the period between 1971 and 1990, with the use of a contingency table to categorise funds into winners and losers. He documented hot-hands persistency during the 1970s, but no evidence was found in the 1980s. He commented that investors do not benefit by investing in hot-hands because the load charge at that period is as high as up to 8 per cent. His results showed that the superior funds in the 1980s performed badly in the following years. Hence, he concluded that there is no reason to assume that the Efficient Market Theory does not exist in the security market. He attributed the funds persistence to survivorship bias and benchmark error in the model.

The Non-U.S. Evidence

There is also rich literature on performance persistence in the U.K. (Quigley and Sinquefield, 2000; Blake and Timmermann, 1998; Fletcher, 1999). Quigley and Sinquefield (2000) studied the performance persistence of U.K. equity unit trusts, using 752 equity unit trusts in the UK for the period of 1978 to 1997. They used the CAPM measures and a three-factor model, and included market risk, size and value in the model. The returns were adjusted for risk and expenses. The results showed that only the inferior performer repeated but not the superior funds. Thus, past information plays an important role for investors. Investors can use this information as a guide to avoid holding funds at the bottom deciles.

Blake and Timmermann (1998) examined the performance persistence of 2,300 U.K. unit trusts between 1972 and 1995. Portfolios were sorted based on the preceding twenty-four months and arranged in quartiles. Then, these equal-weighted portfolios comprising the top quartile performers and bottom quartile performers were formed and held for one month. Evidence of performance persistence was found in both the top and bottom performers in the U.K. They concluded that past performance of unit trust funds does provide useful information for future fund selection. Fletcher (1999) inspected the performance persistence of 85 American unit trusts in the U.K. from 1985 to 1990. Using both the conditional and unconditional Jensen alpha, trusts were ranked on their previous one-year cumulative excess returns and grouped into quartile portfolios. Then, the evenly weighted monthly excess return was predicted for the subsequent year. The author documented no evidence of performance persistence in this study.

Outside the U.S. and the U.K., studies of persistence have been done by Dahlquist, Engstrom and Soderlind, 2000 (Sweden), Deaves, 2004 (Canada), Kaukinen and Bostrom, 2006 (Sweden), Abdel-Kader and Qing, 2007 (Hong Kong), Hsu and Lin, 2007 (Taiwan), Casarin, Piva and Pelizzon, 2008 (Italy), Deb, Banerjee and Chakrabarti, 2008 (India), Brown, 2008 (South Africa). Most showed evidence of performance persistence. However, no evidence of persistence was detected in Sweden and Italy.

Dahlquist, Engstrom and Soderlind (2000) used 210 Swedish funds for the period of 1993 to 1997 to estimate the performance persistence of Swedish mutual funds by analysing the one-year holding period using Jensen alpha. They showed that persistence did not exist in equity or bond funds, but did exist among money market funds.

Deaves (2004), using five-factor model conditional CAPM alpha as the performance measure, studied performance persistence of 110 to 300 Canadian equity funds over the period 1988 to 1998. Significant evidence of short term persistence was documented when a one-year holding period was used to predict the performance of the subsequent year.

Kaukinen and Bostrom (2006) examined the short term persistence of the four largest Swedish banks in Sweden from 1994 to 2005, using the median of the four banks as a benchmark on monthly and annual returns; no significant evidence of persistency for the banks was found.

Abdel-Kader and Qing (2007) analysed the performance persistence of 30 Hong Kong mutual funds. Using both Jensen alpha and Treynor performance measure, funds were ranked at two-year consecutive gaps. The authors found evidence that Hong Kong mutual funds underperform the benchmark market. Evidence of performance persistence was documented for both the winners and losers funds in the short run. Hence, this paper provided evidence of hot-hand and icy-hand phenomenon.

Hsu and Lin (2007) investigated Taiwan's domestic equity funds performance from 1999 to 2003 with the aid of the measure of technical efficiency. Significant hot-hand effect was documented. Thus, the authors concluded that Taiwan investors could benefit by chasing past performers and avoiding past losers.

Casarin, Piva and Pelizzon (2008) examined the fund performance persistence of Italian managed funds from March 1988 to August 1999. They found no evidence of hot-hand

phenomena using raw returns as the performance measure and commented that it was consistent with the Efficient Market Hypothesis. However, when the risk-adjusted returns of the Jensen measure were used as a performance measure, weak evidence of hot-hand effect was documented. In addition, they also showed no evidence of long-run persistence on risk-adjusted returns. The authors concluded that the performance persistence results are quite sensitive to the performance measure used in the analysis.

Deb, Banerjee and Chakrabarti (2008) assessed 62 India equity funds over the period of January 2000 to June 2005 using raw returns; the tracking error was created over their benchmarks and the information ratios was used as performance measures. Out of which 47 were growth funds and the balance funds were Equity-Linked Saving Schemes and tax saving funds investing in equity with a typical lock-in period of three years. The authors recorded evidence of performance persistence in growth funds, particularly over a one-year assessment horizon, but no evidence of shorter periods or longer than one year.

Brown (2008) used different performance measures of raw returns, Sharpe, Treynor, Sortino, Jensen alpha and Omega statistic to investigate the quarterly performance persistence of the South African unit trusts from March 1993 to December 2004 for Equity, Growth and Value funds. The evidence of performance persistence was found in all six measures of performance using the ranking methods and the contingency table. However, the degree of significance of the test results depends on the measures used; the Jensen alpha and Omega statistic exhibited strong persistence of up to four quarters.

Persistence in Hedge and Venture Capital Funds Performance

In the more recent study, persistence of hedge funds and venture capital funds was examined. The findings are mixed. Some authors documented evidence of performance persistence in hedge and venture capital funds (Jagannathan, Malakhov and Novikov, 2010); while some found no significant evidence (Menser and Schmid, 2009; Phalippou, 2010).

Menser and Schmid (2008) investigated the persistence of both the raw returns and risk-adjusted returns for 1,150 equity hedge funds, from January 1994 to December 2005. They found weak evidence of persistence in raw returns and no persistence in returns after more than one year. However, the evidence of performance persistence was provided when the risk-adjusted returns – Sharpe Ratio, market beta and alpha from the multifactor model – were used, and it was stronger in the top funds rather than in the bottom funds.

Jagannathan, Malakhov and Novikov (2010) examined the monthly returns performance persistence of the U.S. hedge funds from May 1996 to April 2005 using a hedge fund style benchmark and also to identify manager selectivity skill. Performance persistence was found among the superior funds, but not among inferior funds. They also recorded more than 25 per cent of the abnormal performance during a three-year period continued into the next period. Strong evidence of performance persistence was found among the top performing group; while only weak evidence was found among the inferior group. The authors concluded that their findings support the explanation of evidence of superior managerial skill.

Phalippou (2010) analysed venture capital funds from 1980 to 2003 and argued that these funds were mainly backed by more sophisticated and skilled investors. The fund performance persistence and performance-flow relationship were examined. In this study, no evidence of performance persistence was detected, however, significant evidence of performance-flow relationship was found. The author explained this outcome as skilled investors using disseminated information to allocate their capital efficiently, and, subsequently, the performance predictability was eliminated. He attributed the fund persistence to the behaviour of unsophisticated investors. He commented that fund performance could not be predicted if investors are sophisticated.

Generally, most studies found evidence that manager stocks picking ability persists over a short period, however, on average, funds generate negative abnormal returns persistence. The evidence of fund past performance persistence was found in most of the U.S. research, which suggests that past performance contained valuable information to the investors. However, the persistence depends on the ranking position of fund returns. Strong evidence was found to support the existence of persistence in poorly performing funds and the evidence for persistence in superior performing funds was mixed.

The current research suggested the past information proved to be of use. However, it must be used with care. Investors might mistakenly invest in the past superior performing funds, while these superior past information may be just some weak predictors. Research evidence also shows that investors tend to keep poorly performing funds hoping that they will turn good, whereas they should sell them.

Overall, the fund performance persistence study is still an interest in mutual funds research. It started in the early studies, prior to the 80s, when longer selection periods were used in the analysis and generally no persistence or weak evidence were found in these analyses. Then, moving though the 90s, the analysis was done over a shorter holding and selection period and most studies found evidence of funds persistence of performance, which was also known as the hot-hand phenomenon. The majority of these studies were done using the U.S. data and some the U.K.'s, thus, such evidence represents the mutual funds investment behaviour in the developed funds market. The latest studies, in the new millennium, also found evidence of performance persistence with provision. The findings are strongest in the inferior funds category. Thus, it is worthwhile for investors to mark the current poor performing funds. In addition, it was highlighted that the persistence findings were very sensitive to the period of study (Brown and Goetzmann, 1995; Malkiel, 1995).

3.3.5 Research on Fund Flows and Performance

Since the 1990s, there has been a remarkable increase in the amount of empirical literature in the study of the relationship between the mutual fund performance and the subsequent inflows of new money into these funds, which measures the behaviour of mutual fund investors. One of the most significant determinants of investors money inflows into funds is the funds past performance. Investors tend to chase returns, but do not dispose of poor performance. Studies have also been done on investor responses to expenses when investing in mutual funds. The fund flows and performance research started from Spitz (1970) and Smith (1978), followed by the studies done by Ippolito (1992), Hendricks *et al.* (1993), Roston (1996), Chevalier and Ellison (1997), Goetzmann and Peles (1997), Sirri and Tufano (1998), DelGuercio and Tkac (2002), Nanda *et al.* (2004), Barber, Odean, and Zheng (2005), and until the recent ones by

Ivkovic and Weisbenner (2009), Rakowski (2010), Benson, Faff and Smith (2010) and Phalippou (2010).

Generally, the fund performance and the capital flows into these funds were found to be positive and asymmetric (e.g., Chevalier and Ellison, 1997; Sirri and Tufano, 1998; Sawicki, 2001; Lynch and Musto, 2003; Goriaev, Nijman, and Werker, 2004; Berk and Green, 2004; Berk and Xu, 2004; and Kempf and Ruenzi, 2008). Some authors use the word convex instead of asymmetric. Chevalier and Ellison (1997) commented that the presence of performance and flow relationship is good as this phenomenon provides an incentive to funds to achieve a better return. Sirri and Tufano (1998) also found a similar asymmetric reaction of flows to fees.

Hendricks *et al.* (1993), Ippolito (1992), Gruber (1996), Chevalier and Ellison (1997) and Sirri and Tufano (1998), DelGuercio and Tkac (2002) found that investors are attracted to good previous year returns. Empirical evidence shows that investors are attracted to investment in funds that were doing relatively well in the past. The relation between the new investment and the funds past returns were positive. However, the sign of the relation was different between the good performance and poor performance. Similarly, these authors found a convex relationship between the money flows and fund performance. Recent funds that have performed well experienced higher money flow growth; while funds that perform poorly in the recent period experienced less outflows of capital. This means investors buy funds with superior past performance; but are reluctant to sell funds that performed badly in the past.

There is a substantial body of literature on the mutual fund flow-performance relationship (Ippolito, 1992; Gruber, 1996; Sirri and Tufano, 1998; Goetzmann and

Peles, 1997; Del Guercio and Tkac, 2002; Nanda *et al.*, 2004). Generally, evidence shows that investors allocate money disproportionately among good and bad performers. They prefer to invest their money in past winners and are less willing to invest in past losers.

Several studies tried to suggest the theoretical explanation of money flows and fund performance relationship (Gruber, 1996; Goetzmann and Peles, 1997; Barber *et al*, 2000; Lynch and Mustro, 2003; and Berk and Green, 2004). Gruber (1996) attempted to explain the reasons why investors did not sell funds that perform badly. He explained that investors could be classified into three disadvantaged clientele, namely, the tax disadvantages, institutional disadvantages or the unsophisticated investors. However, there is a group of sophisticated clientele who managed to identify the good performing assets.

Investor Behaviour

Some studies looked into the aspect of human behaviour or investor psychology. They assumed that this behaviour of investors is irrational (Goetzman and Peles, 1997; Barber *et al.*, 2005). Goetzmann and Peles (1997) explained the investor behaviour using Festinger's Theory (1957) of cognitive dissonance. In a questionnaire-based study, they found that investors tend to reduce their discomfort feeling over their past investment choice and are reluctant to switch funds from poor performers, thus, an overly optimistic perception was formed on these past poor performing funds. Investors believed that the poorly performing funds would perform better than they actually did. In this case, investors' belief changed to meet their past actions. This fact was further explained by Shefrin and Statman (1985) as selling winners too early and riding losers too long, namely, the Decomposition Effect.

Based on cognitive dissonance, Goetzmann and Peles (1997) concluded that investors did not reprimand poor-performing funds because they adjusted their main beliefs to support the regretful choices they had made earlier; while they were overly optimistic over the past returns. This was due to the positive bias that existed in investors' memories. The main characteristic of dissonance of Festinger's Theory is that investors tend to change their belief in order to match it with their past actions. Consequently, although advertising is not able to influence new investor decisions, it could at least help in retaining the existing.

Berk and Green (2004) argued that investors are rational when they use past performance as new information on managerial ability, which would affect the cash flow. Odean (1998) documented that investor's behaviour of attempting to avoid realizing losses by keeping the poor performers, is an example of the disposition effect introduced by Shefrin and Statman (1985). Barber *et al.* (2003) and Odean (1998), studied the trading behaviour of individual mutual fund accounts and explained the asymmetry relationship as representative heuristics. This disposition effect was explained in Kahneman and Tversky's (1979) Prospect Theory. The risk taking investors are willing to take up some possible losses, while the risk adverse investors will only be comfortable if the gain is assured. Investors expect to turn their losses into gains in future by holding onto their losers. This is a reasonable explanation that investors may opt to hold on to their loser funds for too long and sell the winner funds too early.

Barber *et al.* (2003), in a study of trading behaviour of more than 30,000 households, documented that past returns are used to signal the fund's quality and fund's future

performance. They referred to this trading behaviour of individual mutual funds as representative heuristics in behavioural finance. The high past return of a fund is likely to bring a higher inflow of funds in the following period. Investors are over-optimistic on fund performance and they are reluctant to exit the loosing funds.

Sawicki (2001) attributed the convex relationship between flows and performance to the poorly informed or irrational investors, the cognitive dissonance. This was due to the switching cost, which hinders investment from exiting the poor performing funds.

This convex flow-performance relationship is observable when either raw returns or excess returns of performance rankings were used (Sirri and Tufano (1998), Fant and O'Neal (2000), Bergstresser, Poterba, Chalmers and Tufano (2006) and Christoffersen, Evans and Musto (2006)).

Fund Ranking

However, Fant and O'Neal (2000) and DelGuercio and Tkac (2002) found that flows responded to the performance rank based on risk-adjusted performance measures, such as Jensen's Alpha or Carhart's multi-factor Alphas. Some studies (Myers, 2001; and Navone, 2002) constantly stated that rank measures describe inflows much better than cardinal measures. The findings of survey studies on investors purchasing decision by Capon, Fitzsimons, and Prince (1996) exhibited that fund rankings are the most important information and deciding factor for fund investors. In analysing the impact of advertising on the flows and performance relationship, Jain and Wu (2000) documented that the choice of performance measures of the benchmark-adjusted returns and raw returns did not make any difference in their results. Similarly, Sirri and Tufano (1998) provided evidence that either using the ranking of raw returns or one-factor Jensen

alpha yield consistent results. The unadjusted raw returns were also used by Guercio and Tkac (2002) in determining the factors that affect the fund flow of managed portfolios.

Determinant of Fund Flows

Some papers attempted to establish the theories to explain the relationship between the fund flows and determinants other than performance (Gruber, 1996; Sirri and Tufano, 1998; Chevalier and Ellison, 1997; DelGuercio and Tkac, 2002). Funds with good past performance are rewarded with large cash inflows. However, loser funds are not punished with equally funds flowing out. The natural logarithm of fund size and funds total net asset, was included as a control variable by and Sirri and Tufano (1998), Chevalier and Ellison (1997) and Kempf and Ruenzi (2008) based on the argument that large funds would not be growing at the same rate as small funds. The authors found consistent results of a negative and highly significant relationship between fund flow and fund size. This showed that smaller funds grow more quickly than large funds.

When the log of fund age was included as the control variable in the study, Chevalier and Ellison (1997) found an inverse relationship between fund flow and the age of the fund. They claimed that as the investor perception of fund quality was based on the historical data of fund performance, flows from the older funds would not be as responsive as the younger funds. A similar relationship concerning fund's age on net fund flows was obtained in DelGuercio and Tkac (2002) and Bergstresser and Poterba (2002).

Sirri and Tufano (1998) uncovered that search costs were a significant factor in the fund flows performance sensitivity. They documented a negative influence of search costs on

fund flows. They argued that flows are directly related to high advertising efforts and that there would be an investor capital flight to funds with low search costs. Next, Sirri and Tufano (1998) also documented that fees have a negative and significant impact on flows. However, Harless and Peterson (1998) stated that funds with fees at the top deciles of their sample had significantly higher flows as opposed to those at the bottom deciles for which the impact on flows was significantly negative.

Barber *et al.* (2005) found an inverse relationship between the money flows and fund load fees. The lagged fund flows was included in Hendricks *et al.*'s (1994) model; and it was found to be significant. Sirri and Tufano (1998), using raw returns as the performance specification, included risk variable as a control in their model. The coefficient of this variable was found to be insignificant, while the sign is negative. Their result was robust to alternative risk and performance specification.

However, Ippolito (1992) recorded a weak relationship between risk and fund flows. To examine whether investors prefer actively managed funds, Woerheide (1982) included the portfolio turnover ratio of fund in the flows model and no significant impact of the trading activity on fund flows was documented.

The Spillover Effect

Studies by Ivkovic (2001), Kempf and Ruenzi (2007) and Nanda *et al.* (2004), Patro (2009) demonstrated that fund flows in a fund family are affected by the performance of its member fund, which is documented as the positive spillover effect. Some funds might benefit from this effect if the family owns one or more superior performance funds; and this top performer helped to attract money flows into other funds in the same

family, in line with Sirri and Tufano (1998), Ivkovic, (2003); and Nanda *et al.* (2004). On the other hand, losers do not experience large cash inflows of funds in the family which are larger than the expected fund inflows for the funds' own performance. Khorana and Servaes (2005) documented that the presence of star fund in fund family will give a positive effect on a family's market shares. The star dummy in the study was calculated by first counting the number of funds in the fund family that fall within the top 5 per cent of their objective class. There are many past studies examining the fund's spillover effect by using different methodology and inclusion of different determinants in the fund flow model. The study and the findings are shown below (Ippolito, 1992; Sirri and Tufano, 1998; Lynch and Musto, 2003; Goriaev, Nijman, and Werker, 2004; Ivkovic and Weisbenner, 2009; and Benson, Faff and Smith, 2010). Studies by Jain and Wu, 2000; Barber, 2005; Gallaher *et al.*, 2006; and Huang, Wei, and Yan, 2007) examined whether marketing and advertising have any spillover effect on new fund flows generating. On the other hand, the smart money effect was examined by Gruber (1996) and Zheng (1999). The authors examine whether the money inflows will lead to the fund performance in the subsequent period.

Ippolito (1992) ran fixed effect pooled regression on the annual data of 143 open-ended mutual funds and he showed that the performance-flow relation was stronger in funds with positive market-adjusted returns than the funds with negative returns. He provided evidence that funds that outperformed the market have unequally higher flows; and the flow response was strong for actively managed funds. He showed that the fund flows and performance relation are stronger in funds with lower load costs than higher load costs.

Sirri and Tufano (1998) carried out a broad study of net fund flows of mutual funds and recorded a convex relation between fund flows and past performance both in the top and bottom quartile funds. This means that investors pursued high past returns far more intensely than they got rid of the bad performers, which confirmed the findings of Goetzmann and Peles (1997). With higher marketing activities, which are reflected in the higher fees, the performance-flow relationship of funds is even greater. Funds that receive more media attentiveness and are owned by larger fund families have greater flow growth than their counterparts. This is because these funds benefit from lower search costs as larger fund families are more noticeable to investors and large fund families offer a variety of services to investors, for example, more fund choices are available to investors and they could switch from fund to fund easily without incurring additional cost. However, Sirri and Tufano (1998) found that funds in large fund families do not experience a stronger performance-flow relationship. They also found that non-linearity is present when including three-year and five-year lagged returns.

Zheng (1999) examined the issue of investors fund picking ability. The author found that funds that receive new money did significantly better than those funds that did badly, and only a portion of this effect could be explained by chasing past winners. It was possible to use past fund flow information in picking superior performance of small funds and subsequently earning abnormal returns. This effect was called the smart money effect by Gruber (1996), who found no significant relationship between money inflows and the following good performance. Zheng concluded that the smart money effect was due to the fund-specific information; and small funds mainly earn above their average returns.

Jain and Wu (2000) investigated the advertising impact on the fund flows and past performance relationship with a sample of 294 open-end equity funds advertised in Barron or Money Magazine from 18 July 1994 to 30 June 1996. They found that increased flows were related to the increased marketing expenditures. However, it was found that the increased marketing expenses would not subsequently increase the fund performance. Mutual fund families may advertise to attract investment, as long as investors believe that fund performance persists. Moreover, advertising may increase capital flow as it reduces search costs. The authors also concluded that the emphasis of past performance in advertising was a misrepresentation. Mutual fund families over reward the past returns, which could not be used to predict future performance.

Lynch and Musto (2003) commented that good performance is more informative than poor, the signal received by investors from a superior fund is much stronger than that received from an inferior fund. The non-linear response and the change in strategy happen after the negative performance. The expectation of better fund performance; associated with the change in strategy is sufficient to justify the stay of investors in these funds.

Goriaev, Nijman, and Werker (2004) recorded that the past 6 to 8 months fund returns seem to have the strongest impact on net flows, while the most recent three month returns have the least impact on flows, and performance up to nine months lagged has the strongest effect. The asymmetry flow and performance relation was documented in this study.

Johnson (2007) used a unique trade-level dataset of individual shareholders from one no-load fund family to examine the behaviour of fund investors' horizon for the period

between 1994 and 2000. He found that new and old shareholders were sensitive in the period of increasing performance and the relationship was positive, however, they were not sensitive in the periods of declining performance. He suggested that intra-family transfers are induced by the performance of funds.

Patro (2006) examined the flow-performance relationship in funds that invested in non-U.S. equity securities for the period of January 1962 to December 2003 and compared the result with the domestic U.S. mutual funds. A strong relationship between U.S. based international fund inflows and the correlation of the fund's assets and the U.S. market was documented. This is because investors seek international diversification. Next, flows were found to be related to current and past fund performance, which is consistent with the performance chasing phenomenon. In addition, the author provided evidence of fund outflows earlier and during the currency crises in emerging markets.

Employing the CRSP mutual funds data between 1993 and 2004, Huang *et al.* (2007) found that a convex relationship of fund flows to past performance is uniform with individual optimization. Funds that incurred more marketing expenses and distribution costs attracted new investment with just a small amount of improvement in their performance. In contrast, funds with low marketing costs needed to have greater improvement in performance in order to attract new investment.

Del Guercio and Tkac (2008) examined the star effect on mutual fund flows using event study methodology. They established that it was the change of star rating rather than its performance measure that determines the new money flows. Positive fund flow was associated with the rating upgrade while the negative fund flow was associated with the

rating downgrade. The effect appeared immediately in the month of change in rating. The authors commented that investors seem to penalise the drop in performance.

Kempf and Ruenzi (2008) used nine years data from 1993 to 2001 for all U.S. equity funds to examine the impact of a fund position in a family to investor's decision. With the use of piecewise linear regression model, they found that the significant impact of large inflows were related to both the top ranking of a fund in its market segment and was also related to the top ranking of a fund in its family. This effect was more obvious in the larger family. The author also provided evidence of an asymmetric relation between the fund performance and fund flow, and that investors chase past winners but did not sell past losers. Fund size and fees exhibit a significant inverse relationship with net cash inflows. The lag fund flows, family size and the star ratio exhibit a significant positive response to net inflows. The study showed that a large family is more visible and, thus, attracts greater inflows of money while the fund age was insignificant.

Ivkovic and Weisbenner (2009) found that individuals were less willing to dispose of their fund holdings that did well and were more inclined to sell the inferior performers when the authors related the study to tax considerations. They found a significant relationship between investors 'money flows and investment costs. The authors attributed the finding to the trading decisions, which were sensitive to both the load fees and management expense. In addition, fund inflows were found to react to relative returns while fund outflows were responsive to the absolute returns. This study also suggests new money flows into the best performers in an objective classification.

Benson, Faff and Smith (2010) carried out a concurrent assessment of the flow-return and return-flow relation and examined the interrelations between these key indicators of

mutual fund outcomes. The author documented that current returns have a positive impact on current flows, implying that investors respond rapidly to performance information. However, current flows did not influence current returns on all funds. The fund flows in big funds and well-known funds, which induce investor decisions, had a negative relationship with return. Investors in institutional funds were able to recognize good or bad funds and react in the present period consequential in an obvious positive effect of flows on returns.

The evidence of fund performance-flow in the non-U.S. studies is mixed. Some found no significant relationship between the past superior performance (Deaves, 2004; Keswani and Stolin, 2008; and Benson, Tang and Tutticci, 2008; while others documented insignificant inflows of funds and past winners (Sinha and Jog, 2005; and Alves and Mendes, 2006). The detail studies are presented as follows.

Keswani and Stolin (2008) investigated the smart money effect in the U.K. and found that this effect existed and was driven by the purchase not the sales of funds by both the individual and institutional investors. Using the money flows monthly data available from 1992 to 2000; they documented that U.K. investors chase high performance. The fund inflows rose with the increase in past returns while the cash outflows dropped with a decrease in past returns; this effect was more obvious in the inflows than outflows for both the individual and institutional investors.

Deaves (2004), using annual data for 64 Canadian mutual funds between 1988 and 1998, found a significant response of current risk-adjusted performance on fund flows. The non-performance variables of MERs, loads, age, size, and total risk were considered in his piecewise regression model following Sirri and Tufano (1998).

Twelve-month return is used as a proxy for risk and the estimated coefficient was significantly positive while the fund size was significantly negative. MERs, load fees and age were all statistically insignificant. Categorising funds into top and bottom performance, he found that flow and performance relationship was convex with top performance positively related to flow and that there was no significant relation between underperformers and flow. Past positive returns also induced fund growth. Fund size coefficient estimate was negative. This was explained as investors preferred to invest in smaller funds than larger.

Sinha and Jog (2005), examined Canadian mutual funds of a much larger sample than Deaves (2004). The sample consisted of 968 funds with 68,346 monthly data; they found that performance, risk, lagged flow and family size were highly significant and positively associated with capital flow. Fund size and the loser dummy were inverse and significantly associated to flow, while fund age, MER and the star dummy were insignificant. The authors documented significant fund-specific effects but no significant period effects. Several of the results of Sinha and Jog were not in line with the literature or theory. The authors also confirmed the positive and significant coefficient of risk on flows as in Deaves (2004). The MER and age variable was reported insignificant, which differs from the result reported by Chevalier and Ellison. Their finding of an insignificant star dummy and a strongly significant and negative loser dummy implies that Canadian mutual fund investors heavily penalised underperforming funds. This result was different from what was reported by Deaves (2004) and the earlier U.S. mutual fund studies.

Benson, Tang and Tutticci (2008) applied Australian open-end equity funds, including wholesale and retail funds from July 1995 to June 2006, with a total of 524 wholesale

funds and 894 retail funds to examine the determinants of the fund family characteristic to fund flows. The authors found that family performance had no significant impact on individual fund flows. Investors responded to large families. This could be because larger families offer the benefits of economies of scale, which then lower fees for investors. Next, retail investors, the less sophisticated investors, favour older funds, which confirm that age is a significant indication for quality. The families with star performing funds exhibit significantly higher inflows of money.

Alves and Mendes (2006) investigated the small mutual fund market of Portugal. Their sample included all 30 Portuguese open-end domestic equity mutual funds over the period of December 1993 through March 2001. The result showed that fund investors in Portugal did not generally respond to fund returns. The absence of flows and performance relationship were attributed to either the low level of investor sophistication, conflicts of interests in the Portuguese universal banking industry or the existence of relevant back-end load charge, which put off investors from withdrawing their capital.

In general, the fund flows and performance still remain an interest in mutual funds research. Most past studies found that individual investors chase past winners. Indeed, behavioural finance explains some of the flow-performance relationship.

3.3.6 Empirical Evidence of Behavioural Finance

Behavioural finance is the study of psychology and finance together to explain how people invest. It seeks to supplement the standard theories of finance, which assumes that investors are rational. However, opposing the Efficient Market Hypothesis,

behavioural researchers found that the existence of market anomalies is consistent with investor irrationalities.

Cognitive Dissonance

Festinger, Riecken and Schachter (1956) established the theory of cognitive dissonance. When two concurrently held cognitions are conflicting, it creates a state of cognitive dissonance. The person tries hard to lessen it by adjusting their beliefs because the experience of dissonance is unpleasant. Festinger's Theory (1957) of cognitive dissonance is an uncomfortable feeling of regret over mistaken beliefs that individuals will try to take action, such as avoiding new information.

Heuristic

Investors may react to irrelevant information and, hence, may trade on noise and non-information, rather than information. Investor sentiments create disturbances to efficient prices. Behavioural finance scholars believe that people will make errors and people use heuristics rather than rational models to analyse data. Heuristics are rules of thumb, common sense or intuitive judgment. It is a process through which people discover things by trial and error. A heuristic investor invests in funds that performed well in the previous year. Literature in behavioural finance documented inconsistencies with the Efficient Market Hypothesis. Efficient Market Theory assumes that investors are rational. They are able to price the securities correctly to reflect all available information.

Tversky and Kahneman[2] (1973) established the availability heuristic. It is a judgmental heuristic in which one assesses the likelihood of events by availability. In 1974, Tversky and Kahneman established three heuristics that are used when making judgements under uncertainty, namely, the representativeness, availability and anchoring. The representativeness heuristic happens when investors over rely on the past performance of funds. Investors tend to assume that funds with superior past returns will perform well and that those with weak past returns will perform poorly. Availability is a phenomenon where investors tend to invest in what they know and the funds that advertise their star performance. Nonetheless, the mean Reversion Theory shows that the reversion of this is correct. Anchoring is a phenomenon in which people tend to stay within the range of what they already know and make guesses for what they do not know in decision making.

Herd behaviour and overconfidence are forms of heuristic. The social influences have a strong power on individual judgement. When people are confronted with the judgement of a large group of people, they will forgo their own rational decision and adopt behaviour that is similar to the group, as they think the decision of a large group cannot be wrong and that this is rational behaviour. However, this behaviour, although individually rational, produces group behaviour that is irrational in the market.

Prospect Theory

Kahneman and Tversky (1979) with other psychologists researching the psychological finance notion, concluded that investors are not rational and investors focus more on risk and losses than gains, described as the Prospect Theory. The groundwork of the

[2] Daniel Kahneman and Tversky, both are psychologist. Kahneman was awarded the Nobel Prize in 2002 for his work of *prospect theory* while Tversky, one of the worlds's most cherished and prominent psychologist died in 1996, at the age of 59. If not because of his death, he would surely share the Nobel Prize with his collaborator.

Prospect Theory is that investors are more emotionally sad when they make losses than they are delighted about gains. The Prospect Theory was developed as an alternative to the expected Utility Maximisation Theory when the Utility Theory (Kahneman and Tversky, 1979) was systematically violated by investors. The implications of the Prospect Theory and of other psychological behaviour concerning individual decision making and information gathering for the behaviour of financial market makers have been studied both theoretically and empirically. People have a preference for a certain outcome and individuals are risk takers for losses. This explains some grounds of investors' irrational behaviour. The Loss Aversion Theory postulates the phenomenon that investors prefer to take on risk when faced with losses.

Regret Theory

Kahneman and Tversky (1991) showed that the loss of one dollar is twice as agonizing than the enjoyment obtained in gaining one dollar. The tendency of investors to hold on to loss making stocks but sell winning stocks too early is explained by loss aversion. Shefrin and Statman (1985) termed this as Selling Winners Too Early and Riding Losers Too Long. This fact is further explained by the Regret Theory, which states that individuals will act irrationally if one wishes to avoid the pain of regret. Investors will not want to recognise the error they made by delaying the selling of the losing stocks. The Regret Theory explains the phenomenon that money flows more rapidly into well-performing mutual funds than flows out of funds that have performed poorly, the decomposition effect. With respect to the flow-performance relationship, Berk and Green (2004) commented that the behaviour of investors that chase past behaviour is rational as investors are using past returns to interpret the managerial ability in money allocation. The authors documented the investors' unwillingness to sell recent poor performing funds. Kahneman, Knetsch and Thaler (1990) reported several experiments

that exhibit that the loss aversion effect continues to exist, even in a market surrounded with opportunities to learn. The authors concluded that loss aversion was an essential attribute of preferences.

Herding Behaviour

Grinblatt, Titman and Wermers (1995) reported evidence of momentum strategies and herding effect when they examined the behaviour of mutual funds. They also established that mutual fund investors picked funds based on historical funds performance; investors bought funds that were past winners, but did not sell the losing funds. The behavioural bias includes cognitive dissonance, which suggests that investors experience an internal conflict when their belief is proven wrong. Goetzmann and Peles (1997) applied Festinger's (1957) cognitive dissonance hypothesis to examine mutual fund investor behaviour. They found that mutual fund investors also tend to revise their belief to reduce apparent logical conflicts; even well-informed investors bias their view about past performance. The fraction of uninformed fund managers exceeded the proportion of naive investors.

Wermers (1999) examined the herding effect on stock prices and mutual funds and concluded his findings were uniform with the herding effect in mutual funds, which accelerates the price-adjustment process. Hsieh, Yang and Yang (2010) examined the herding behaviour of mutual fund investors of 13 Asian emerging countries over the period of January 1996 to October 2004. They found the existence of positive feedback effects and some herding behaviour. The evidence was more significant in countries that were affected by the financial crisis. The authors also commented that the behaviour of mutual funds investors might have caused the financial crisis and that the herding behaviour was more significant during and post crisis, that is, investors tended to herd

during economic instability. Barber, Odean, Zhu (2009) found a high correlation and persistence in investors trading records. This systematic trading of individual investors was not due to institutional herding. The correlated trading of individuals was attributed to the psychological biases that caused investors to systematically buy stocks with a good track record of performance, stop selling losing stocks and be buyers of stocks with extraordinary high trading volume. Liao, Huang and Wu (2010) documented that past investor sentiment cross-sectionally explained the magnitude of fund managers herding, especially when managers herd to sell.

Overconfidence

One important behavioural determinant to understand the market anomalies is known as overconfidence. Investors always overestimate the power of discerning fund winners from losers. Thus, those investors immediately sell and buy back funds to realise gains. This was documented by Odean (1998) who showed that the disposition effect demonstrated the tendency of investors to sell winners too quickly and to hold on to losers too long. Glaser and Weber (2009) documented that trading activity, being measured as the stock portfolio turnover or the number of stock transactions, is influenced by market returns and historical portfolio returns. Great past portfolio performance made investors overconfident owing to a self-attribution bias. They were overconfident in themselves as they thought themselves to be better investors than others. High historical market performance also made investors overconfident as they undervalued the instability of stock returns. Muller and Weber (2010) examined the financial literacy and mutual funds investment decision. They established that the popularity of actively managed funds usually with high expenses is positively associated with a lack of financial literacy. They also found that the level of financial

literacy was not related to the fund returns, but that overconfidence might prevent the investors from investing passively.

A Securities Markets Theory was suggested by Daniel, Shirshleifer and Subrahmanyam (1998). It was derived from investors' overconfidence about the accuracy of undisclosed information and biased self-attribution that led to changes in their confidence. Consequently, it leads to market under and overreaction. Harless and Peterson (1998) examined the persistence of the poor performing funds and the behaviour of mutual fund investors. The authors explained that the survival of poor past performing funds was due to the representativeness of the heuristics behaviour of investors. Investors anchor the judgement of future fund performance on extreme previous returns, but lack in adjusting their judgement for the predictive validity of past returns information where its predictive validity is low. Their study highlights the mismatch between investors' fund selection criteria and the duration they hold funds.

Odean (1999) explained the excessive overall trading volume in stock markets as overconfidence and the disposition effect, which leads to gaining stocks being sold too early and losers being held on too long. Basu, Raj and Tchalian (2008) documented the evidence of irrational investment decision making by buying high and selling low or holding onto those losing funds for too long. Investors continued to buy high during a boom period and began to sell during bears due to their herding behaviour. Investors also hold onto their losing funds due to their loss aversion, a phenomenon known as disposition effects (Shefrin and Statman, 1985). The individual ability to process information rationally was unable to keep up with the pace of information advancement.

Barber and Odean (2001) documented that men deal 45 percent more than women. This leads to men's returns being lower than women, comparatively. They attributed this as the overconfident behaviour of men.

Overreaction

Other studies in behavioural finance are discussed as follows. Shiller (1987) examined the investor behaviour in the stock market crash in 1987. He provided evidence that investors perceived that markets could be predicted. Both the buying and the selling investor perceived that the markets were over-valued before the crash and most investors were of the opinion that the crash could be attributed to the psychology of other investors. Nevertheless, Fama (1998) explained the evidence of market anomalies as opportunity. The overreaction and the under reaction of stock price information were consistent with the Efficient Market Hypothesis. Goetzmann, Massa and Rouwenhorst (1999) found that the behavioural factors could explain up to one-half in cross-sectional change in mutual fund returns and that these inflows have a considerable effect on the view of professional advisors and behavioural factors. Grinblatt and Keloharju (2000) identified the factors that explained buying and selling activity and provided evidence that the determinants of trading includes the past returns and past price patterns, tax-loss selling and the truth that investors were unwilling to realize losses. Shefrin (2002) introduced the psychology issue in the decision making process, which was completely different from the underlying assumption of EMH.

The behavioural finance helps to explain some of the market anomalies that cannot be explained by the Efficient Market Hypothesis or the other financial theories. Investors have been shown to react irrationally to new information. The anomalies indeed suggest

that the underlying principles of investors rational behaviour in the EMH is not completely correct and that human behaviour does play a very important role.

3.3.7 Evidence in Malaysia

Evidence in Malaysian studies, Mohamad & Mohamed (1995); Leong and Aw (1997); Taib and Isa (2007); Taib and Zulkifli (2006) showed no evidence in unit trusts out-performing the market. Leong and Aw (1997) documented that the benchmark used can change the risk-adjusted performance and concluded that the ranking of fund performance was not affected by the choice of benchmark portfolio. However, bond funds were found to outperform both the market and equity unit trusts. Taib and Isa (2007) explained that the high bond performance was due to the high interest rate kept throughout the period of study, particularly during the crisis period, which greatly benefited the bond funds.

The performance of Islamic funds in Malaysia is also an issue of concern. Nik Mohammad and Mokhtar (2008) demonstrated that significant positive relationships exist between the return of the Islamic equity fund and the Shariah market return; while Hakim and Rashidian (2004), and Hussien (2004) documented that there was strong evidence to reject that Shariah compliance investment offered inferior returns compare to non-Islamic investments.

In a comparative performance analysis of Malaysian Islamic equity funds with conventional unit trust funds, also between government and non-government funds for three sub-periods of pre, during and post economic crisis, Abdullah, Hassan, Mohamed (2007) deduced that the performance of the funds were marginally below the market. Islamic funds are less risky than the conventional with lower relative variability.

Conversely, government funds were less risky than non-government funds. All classes of funds showed poor selectivity ability and market timing. Islamic funds outperformed conventional funds during a bearish economic trend. The result reverses during a bullish trend.

In another study, Hayat (2006) also reported that the average Islamic equity funds underperform the Islamic and the conventional benchmark and, also, that Islamic equity funds perform better during a bear market.

Similarly, Abdullah, Hassan, and Mohamad (2007) examined 65 mutual funds, including 14 Islamic mutual funds in Malaysia from January 1992 to December 2001, to resolve whether there is any difference between Islamic and conventional funds. Using the Treynor index, adjusted Sharpe index, Jensen index, and adjusted Jensen index to measure the funds' performances, the authors showed that the Islamic returns improved during the bear period while conventional mutual funds achieved better performance during the bull period. They showed that the fund performances were influenced by the stock market and economic conditions. Both types of funds were unable to attain the minimum 50 per cent of market diversification, however, conventional funds were a little more diversified than Islamic funds. In addition, this study showed that the Islamic funds have a slightly lower level of diversification than the conventional funds. In a separate study in Malaysia, Taib, Salleh and Muhamad (2008) reported that the returns under the follow-the-winner strategy, which was the active management, perform better than the buy-and-hold strategy for conventional unit trusts. They also established no significant difference in passive or active portfolio management for Islamic unit trusts.

Nik Muhammad and Mokhtar (2008) investigated the performance of Islamic Equity funds over the period of 2002 to 2006 with weekly reports collected from Bursa Malaysia. They found that Islamic funds underperformed the market and that these funds had a beta of less than 1, indicating that they had low sensitivity to the market. The authors also admitted that their study was limited by the small sample size.

In the study of selectivity and timing ability of Malaysian funds, Leong and Aw (1997), Soo (2003) and Kok, Goh and Wong (2004) reported that most of the fund managers did not have forecasting ability. This poor timing ability of the fund managers led to the overall negative return performance of funds in Malaysia. This is in line with Badri and Abdullah (2006), who concluded that both the selectivity and timing ability of Malaysian funds were negative. Using 36 unit trusts from January 1995 to June 2001, and separated into the pre, during and post Asian financial crisis, Kok, Goh and Wong (2004) concluded that fund managers did not possess market timing ability in all three periods, however, there was evidence of superior selectivity performance for both the pre and post crisis period. In a separate study, Badri and Abdullah (2006), using 102 unit trust funds from January 1995 to December 2004, found that all types of funds including growth, income and balanced funds outperformed the market portfolio. The author also documented poor securities selectivity skill and inferior market timing abilities among funds managers.

Unit trust performance persistence was explored by Taib and Isa (2007). Using the performance of 110 unit trusts for the period of 1991 to 2001 in Malaysia, with various performance measures: raw returns, market-adjusted return, Sharpe Index, adjusted Sharpe Index, Jensen alpha, adjusted Jensen alpha and Treynor Index, the authors found that unit trust returns is lower than the market portfolio and the risk free returns; while

the monthly variance of the returns was also below that of the market. No unit trust performance persistence was found in this study.

However, Taib, Salleh and Muhamad (2008), computing annual returns for the period 2001 to 2006, evaluated the two strategies of active strategy (following the winner) and passive strategy (buy and hold). The authors found that the published Edge-Lipper winning funds were a reliable source if the naive investors received no professional advice and, especially for investment in the conventional funds. Hence, picking past winners was a better strategy than buy and hold. Lai, Lau, Balachandrher and Fauzias (2003) observed that it was possible for the investors to beat the market or to earn above the average profits by using active strategy. They concluded that technical trading rules in the context of moving average had proven its significant predictability, while the online brokerage analyst's recommendations convey certain valuable information to investors.

Using the questionnaire method, Ramasamy and Yeung (2003) investigated the mutual fund factors that affect the financial advisory and discovered that past performance, fund size, and transaction costs were the three most important factors for the mutual fund advisers and that financial advisers looked for consistent growth of funds over the long term.

Some examined the relationship between the price of unit trusts and the market variables. Soo and Ghazali (2007) reported a significant and positive relationship between stock market index returns and price of unit trust funds. They concluded that a change in the Kuala Lumpur Composite Index ($KLCI^3$) does affect the movement of unit trust prices in the short-run. However, the two variables were not co-integrated or

did not move in line with each other in the long run. This could be due to the fund managers being obliged to adhere to their investment policies with the aim of maintaining a long term allocation strategy. However, Fadhil, Azizan and Shaharudin (2007) investigated the interaction between macroeconomic variables and unit trust performance in Malaysia, using data from 2002 to 2005, and suggested that there was a long term relationship between the net asset value of unit trusts in Malaysia and macroeconomic variables – Consumer Price Index, money supply (M2), Interbank rate and the Kuala Lumpur Composite Index. Lau (2007), using data from 1995 to 2002, concluded that the performance of funds could be enhanced by the inclusion of asset classes with a negative correlation coefficient.

The diversification level of unit trusts in Malaysia was documented as being low. By using the Treynor index and the adjusted Jensen alpha, Leong and Aw (1997) studied 32 private mutual funds in Malaysia, for the period of January 1984 to December 1996. Two benchmark indices were used: the Kuala Lumpur Stock Exchange Composite Index (KLCI[3]) and the Exchange Main Board All Share Index (EMAS[4]). The coefficient of determination and beta of the mutual funds were used to measure the degree of diversification and risk levels, respectively. The diversification level was found to be significantly low and below expectation. In addition, Badri and Abdullah (2006) found the same in their diversification measured relative to the market portfolio, the Kuala Lumpur Composite Index, using the coefficient of determination, R-square. The documented R-square ranged from 0.16 to 0.26 while it was near to 0.70 in developed countries, as documented by Ippolito (1989). The author attributed the low diversification to the regulatory constraint of the Security Commission, limited

[3] The FTSE Bursa Malaysia KLCI comprises the largest 30 companies listed on the Main Board by full market capitalisation that meet the eligibility requirements of the FTSE Bursa Malaysia Ground Rules (Source: Bursa Malaysia).

[4] A benchmark index, which comprises the constituents of the FTSE Bursa Malaysia Top 100 Index and FTSE Bursa Malaysia Small Cap Index (Source: Bursa Malaysia).

investment opportunities or poor adherence of fund managers to the stated fund objective.

Many other issues, as detailed below, are also examined in the unit trust studies in Malaysia. Using various performance measurement models, Lai and Lau (2010) explored the performance of 311 mutual funds for the period of January 1990 to December 2005 in Malaysia. The performance measures used were single market model and Fama French's three-factor model Carhart's four-factor model, which provided evidence that mutual fund performance yield superior returns with relatively lower systematic risk. They showed that a three-year investment horizon was the best holding period with an annualised return of 9.23 per cent. The authors also concluded that equity funds, in general, held small market capitalisation stocks and high value stocks, and that they follow a trend of buying superior past stocks and selling inferior past stocks.

In studying the funds classification and investors' investment objectives, Lau (2003) found that the best performers are small company funds, followed by aggressive growth funds, growth funds and index funds. However, in terms of diversification, the portfolio of growth and income funds were the most diversified followed by balanced funds. Lau and Chan (2004) also argued that an improper classification of funds would not only cause a mismatch between investors objectives and a fund's profile, it also affected the process of income smoothing in the life cycle of investors. They also highlighted the importance of a proper classification system of equity funds and its implication towards investor's protection. On the other hand, Jaafar, Ali and Shaharudin (2007) inferred that the internal changes implemented in fund management companies did not result in a superior performance by the fund managers.

Concisely, the studies of unit trusts in Malaysia mostly concentrate on the fund performance assessment. Most of these studies documented no superior performance in unit trusts in Malaysia. However, as most of the studies were done with short examined period due to data availability, the findings needs further researches. Besides, the studies of unit trusts are insufficient and scarce as compared to the evidence available in the developed market.

3.4 CHAPTER SUMMARY

Several issues relating to mutual funds are discussed in this chapter. Mutual funds performance has been a major concern for several decades. Due to the fee charge and cost incurred in the investment of funds, mutual fund research focuses on assessing the ability of fund managers to provide value added service to the unit holders. A variety of performance measures have been developed. Evidence suggests that fund managers do not provide abnormal returns after the fees and expenses.

The evidence of whether fund managers have sustainable superior ability is also another issue that has been examined over the past few decades. The findings for fund's performance persistence appear to be mixed.

The research on mutual fund flows examines the investors' response on past performance. Most studies documented a convex relationship between the two variables. Recent good performing funds experience higher money flows; while funds that perform poorly in the recent period are not penalized and experience less outflows of capital. The asymmetric flow-performance relationship has been documented in most of the previous literature. This finding is explained as: (1) an investor behaviour's state

known as cognitive dissonance or the Festinger's Theory (1957); (2) Shefrin and Statman's (1985) decomposition effect of selling winners too early and riding losers too long.

Fund family's behaviour and strategies are relatively new in the literature. Several studies analysed the importance of family membership on the mutual funds. The strategy of fund family includes the start of new funds, closing star funds, advertising strategy, fund proliferation or even resources transfer.

It is apparent that the majority of the above studies have been conducted in markets in the developed countries. Very limited mutual fund research has been done in the emerging markets. Hence, evidence in this niche market, which is new and small, is questionable and scarce.

This study intends to fill the gap by exploring whether investing all money in a single fund family in Malaysia decreases the portfolio diversification when the correlation of fund returns increase. The fund's flow-performance relationship is also explored in Malaysia.

The research is different from previous studies in that performance persistence is examined at the family level, treating unit trusts as a larger entity rather than individual funds. Goetzmann and Brown (1995) suggested that short term fund performance persistence may be due to the correlation among managers. Hence, examining the fund family performance persistence provides evidence concerning the impact of common management strategies on the fund family performance persistence.