Chapter 2

LITERATURE REVIEW

This chapter reviews the literature related to selectivity and market timing in fund management. Chapter contains five main sections. First, selectivity and market timing concepts; second. an account of the past studies on funds selected selectivity and market timing performance analysis; third, an account of the past studies from Thailand; fourth introduction to the three selectivity and market timing models used in this study; and fifth, a summary of the chapter.

2.1 Selectivity and Market Timing Concepts

The portfolio managers' ability to select undervalued securities and time buying and selling to upswings and downswings in the market is the fundamentals of selectivity and market timing in fund performance analysis (Dellva, DeMaskey and Smith 2001). Alexander, Sharpe, and Bailey (2001) defined selectivity as 'an aspect of security analysis that entails in forecasting the price movements of individual securities' and the market timing as 'a form of active management[1] that a surrogate market portfolio

[1] 'Active equity portfolio management is an attempt by the manager to outperform, on a risk-adjusted basic, a passive benchmark portfolio. A benchmark portfolio is a passive portfolio whose average characteristics (including such factors as beta, dividend yield, industry weighting, and firm size) match the risk-return objectives of the client' (Reilly and Brown 2003, p.653).

and the risk-free asset, depending on the investor's perception of their relative near-term prospects'. These concepts imply that a portfolio manager would prefer a portfolio to bear a low beta when he expects the market to have a lower return than the risk free rate because the low beta portfolio is likely to earn a higher expected return than a high-beta portfolio. On the other hand, he would like to have a high-beta value when he expects the market to get a higher return than the risk free rate because of the higher expected return than from a low beta portfolio. Then, if the portfolio manager was able to forecast the expected return on the market portfolio correctly, his portfolio would perform better than a market portfolio with a constant beta that is equal to the average beta of the manager's portfolio. Hence an ideal mutual fund manager would consequently increase the beta of the portfolio in expectation of a bull market and decrease the beta before a bear market.

Given the above management behavioural dynamics the fund manager's performance can be summed as the market timing ability of adjusting the portfolio composition to benefit from the market cycles and as the ability to select undervalued securities (Reilly and Norton, 2006).

2.2 Overview of Selectivity and Market Timing Ability studies

In performance analysis, apart form the return attainments the finance researchers are also concerned with the performance attributions. Analysis of the performance attributions is vital to successful fund management in a long run. Attributions of fund performance are listed below according to priority (in some what);

- Adjustment of returns for systematic risks.
- Consistency between the investment process and the managers' decision-making process.
- Reflection of managers' short term and long-term (tactical) allocation process.
- Level of fund expenditure

The first and the fourth attributes are generally intrinsic component to the fund. The second and third attributes are linked to the managers' selectivity and market timing abilities. Hence adjustment to risk, selectivity and market timing are separable components of the overall portfolio/fund performance.

2.2.1 Summary of Selectivity performance studies

The first classic risk-adjusted measure, based on mean-variance relationship, called reward-to-volatility ratio was formulated by Treynor (1965) to gauge the performance of a portfolio or fund. Then for the same purpose, Sharpe ratio (Sharpe 1966 and 1994) was developed using standard deviation as the relevant risk measure. Treynors' measure is relatively hard to interpret than the Sharpe ratio. Though both these measures are structurally simple, they fail to distinguish between the intrinsic fund performance components from the fund managers' skills or abilities. Jensen (1968) estimated a proto-type single factor regression model to isolate the fund manager's skill in the form of an intercept (alpha) term. The alpha term measured as constant term for a given portfolio or fund reflects only the selection ability. This single factor model assumes that the risk level of a fund is stationary and thus fails to account for

fund manger's market timing ability. Since the formulation of the Jensen model, several researchers developed a variety of fund performance measures, Information ratio (Treynor and Black 1973), Components of investment performance on *selectivity* and *risk* (Fama 1972), Four-index model (Elton, Gruber and Blake 1996b), M^2 (Modigliani and Modigliani 1997), Four-factor model (Carhart 1997), Three-factor model (Block and French 2002) and so on. All these models focused on further investigation into the factors that contributes to intrinsic funds' performance rather than on fund manger's timing ability.

The table 2.1 (see chapter appendix) presents a summary review of studies conducted in US, Australia and Europe to verify the factors that contribute to fund performance including funds selectivity. As previously commented by Grinblatt and Titman (1989b) and Block and French (2002), these studies are overly dominated by Jenson model usage. Their observation is that even though a number of performance analysis models exist, probably the most widely used in academic empirical study is the Jensen (1968) alpha.

2.2.2 Classic market timing performance studies

Fama (1972) and Jensen (1972) advocate that fund managers often time the changes in their portfolio composition, in anticipation of the overall market price movement. This implies that fund mangers time their buying and selling activities according to anticipated price shifts to reduce risk. Treynor and Marzuy (1966) and Henriksson and Merton (1981) extended the analysis of fund manager's skills with a further breakdown to capture the market timing attribute (Grinblatt and Titman (1989b)).

Treynor and Marzuy (1966) developed a single factor quadratic regression model to examine the performance of 57 mutual funds in the ten-year period, 1953-1962. The squared term of the model denotes the market timing ability component of the performance. The authors assert the time period chosen is long enough to capture a variety of conventional market fluctuations, and short enough to avoid problems subsequently arises from gradual drift that has resulted from modern fund practices and policies. Overall results indicate that there was no evidence to show that mutual fund managers increase the fund`s beta in bull market and decrease it in bear market in order to earn high risk-adjusted returns for shareholders.

The study by Fabozzi and Francis (1979) further supports the findings of Treynor and Marzuy analysis. Fabozzi and Francis designed a single market model with a dummy variable to find evidence of market timing. Authors examined whether the beta for 85 mutual funds differ between bullish and bearish times using the rate of return of funds from December 1965 to December 1971. The results indicate that mutual fund managers did not shift their funds` beta to earn higher return accoding to the changes occurred in market conditions.

Kon and Jen (1978) attempted to explore further the influence of non-stationarity in risk levels on the performance measurement of mutual fund portfolios. Their empirical observation shows that a long term switching of portfolio's risk is experienced with respect to the market movement. As such portfolio manipulations (changes in portfolio composition) tend to further intensify the non-stationarity in funds` systematic risk.

This finding has important implications on future research because if non-stationarity is further strengthened by the timing activities, separable performance measures are imperative for the division of responsibility and allocation of resources between the two tasks.

An year after, Kon and Jen (1979) examined the ability to select undervalued securities and the ability to time market cycles of a sample of 49 mutual funds. They used monthly return data from January 1960 to December 1971 and employed the two-regime switching regression model proposed by Quandt (1972) in the investigation. The empirical evidence on ability to select undervalued securities indicates that although several individual funds demonstrated superior performance, the average performance is negative in relation to a naïve policy (combination riskless asset and market portfolio). In addition, the timing ability results indicate that many funds in the sample set significantly changed their risk level during the time interval of the study.

The models discussed above are based on total risk and therefore well suited to investigate a portfolio consisting of an individual fund.

Merton (1981) developed an alternative model to analyse the underlying theoretical structure of the pattern of returns from market timing. For the purpose of investigation an equilibrium theory of value for market-timing forecasting skills was derived. Merton (1981, p.364) explains the underlying conceptual argument for the theory as

> "The forecasting skill can be partitioned into two distinct components: (1) forecasts of price movements of selected individual stocks (i.e., "micro-forecasting"); and (2) forecasts of price movent of the general stock market as a whole (i.e., "macro-forecasting"). Usually, associated with security analysis, micro-forecasting involves the identification of individual stocks which are under or over valued relative to equities generally. In the context of CAPM, a micro-forecasting attempts to identify individual stocks whose expected return lie above or below the SML"

Macro-forecasting, or 'market timing' in this study tried to identify when equity in general would be under or over valued compared to the fixed-income securities. In other words, Merton's model of market timing attempted to predict when the stocks would outperform bonds and when the bonds would outperform stocks. However model could infer the magnitude of superior performance. The study demonstrated that 'the pattern of returns from successful market timing have an isomorphic correspondence to the pattern of return from following certain investment strategy options where the implicit prices paid for the options are less than "fair" or market values' (Merton 1981, p.365). In addition, by analysing how investors would use the market timing forecast to change their likelihood of beliefs on stock returns, it highlighted that the conditional probabilities of a correct prediction of market returns provided both necessary and sufficient conditions in predicting positive value for the market timing parameter.

Having Mertons' market-timing model as a basis, Henriksson and Merton (1981) formulated a variant and used parametric and non-parametric statistical procedures to test for the superior forecasting skills under two empirical situations. One is when the manager's forecasts are apparent, the non-parametric model can be used without making assumptions about the distributions of securities prices. The other is when only

the time series of realized return is observable; a parametric test of market timing that presumes a specific return-generating process can be applied.

Henriksson (1984) employed the Henriksson and Merton variant model to examine the market timing of 116 mutual funds during February 1968 - June 1980. The data used consists of monthly returns including dividends as fund return and the NYSE Index as return on the market portfolio (benchmark). One-month Treasury bill returns for a holding period of at least 30-day maturity was used as risk free. Findings showed 62 percent of the funds had negative estimate of market timing and only 3 of the 116 funds had significant positive values. The overall conclusion is that there is little or no evidence to say that the fund managers have ability in forecasting large changes better than small changes.

Veit and Cheney (1982) examined the effective timing strategy of mutual fund managers. The authors defined an effective timing strategy as (1) correctly forecasting 'bull' and 'bear' markets, and (2) making appropriate changes in the fund's risk exposure, as measured by beta, in anticipation of forecasted market movements. Four different classifications of bull and bear markets scenarios were used to verify sensitiveness of the timing results to alternative market definitions. An annual return data of a randomly selected sample of 74 mutual funds from 1944 to 1978 and Standard and Poor's 500 Stock Composite Index were used in the analysis. Even though the study suffered from survival bias all funds had at least twelve observations for a (common) time period from 1967 to1978. Also the model explained the ability of the portfolio manager to change the level of systematic risk, both by allocating funds

to individual securities and by the broader allocation of funds to risk classes. Results indicate that only 3 of 74 mutual funds in the sample showed evidence of timing ability under all four different classifications of bull and bear markets and therefore concluded that mutual funds did not successfully change their characteristic line in order to employ timing strategies.

Kon (1983) conducted an empirical measurement of market timing performance of an investment manager using a sample of 37 mutual funds, each with 198-months data from January 1960 to June 1976. The proxies for risk free rate and market portfolio used in the study were 30-day Treasury bill rate and monthly rate of returns on the CRSP value-weighted market index, respectively. Results indicated that at the individual level evidence exists for a relationship between significant superior timing ability and performance. However, fund managers as a group did not have special information with regard to formation of expectations on the returns of market portfolio and therefore on market timing.

Chang and Lewellen (1984) investigated both market timing and security selection abilities using Henriksson and Merton's (1981) procedure. A complete monthly data of returns from 1971 to 1976 on 67 mutual funds was used. In this case the value weighted stock index of the CRSP (Centre for Research in Security Prices) was used as the market portfolio return (benchmark) while the return on Treasury Bills with approximately a 30-day maturity taken at the beginning of each month was used as risk free rate. During the time frame of this study, the numbers of up-markets and

down-markets observations noticed were 52 and 56, respectively. Findings revealed that only a few fund managers have skilful in market timing and security selection.

2.2.3 Market timing performance studies since 1990s

Several studies completed in the 1990s attempted to remedy the gap in the finance literature with regard to market timing and selectivity skills. including Lee and Rahman (1990), Grinblatt and Titman (1994), Ferson and Schadt (1996), Beckers (1997), Danial, Grinblat, Titman, and Wermers (1997), Bello and Janjigian (1997), Kao, Cheng, and Chan (1998), Busse (1999), Goetzmann, Ingersill Jr., and Ivković (2000), Umamaheswar Rao (2000), Dellva, Demaskey and Smith (2001)[2]. The general finding of all these studies is that only a limited number of fund managers have either superior selectivity or timing abilities and the number varies according to the country and prevailing economic situation.

Lee and Rahman (1990) employed the model developed by Treynor and Marzuy (1966) and refined later by Bhattacharya and Pfleiderer (1983) to examine selectivity and market timing during 1979 - 1984. Generalised least squares (GLS) estimation procedure was adopted to obtain efficient estimates of parameters under heteroskedatic situation. Empirical results demonstrated that some degree of superior forecasting ability of fund managers is observable at the individual manager level. The study also revealed that fund mangers with no or inadequate forecasting skills might totally

[2] For more detail, Table 2.2 presents a summary of market timing performance studies since 1990s.

follow passive management strategy and just provide diversification advices to their shareholders' (Lee and Rahman 1990, p. 273).

Grinblatt and Titman (1994) compared Jensens' measure (1968) with two other measures; one is Trenor-Marzuy quadratic regression (1966), the other is positive period weighting measure[3] (Grinblatt and Titman 1989b). Both these measures were developed to overcome the problem of timing-related bias in the Jensen measure (Jensen 1968). The study revealed that these alternative measures exhibit high cross-sectional correlations and there by suggest that the timing-related problem in Jensen measure may not be significant in practice because the measures designed to eliminate this problem yielded almost identical results. One of the prime reason for such observation is that only very few funds successfully timed the market. However the funds experienced successful market timing exhibited significantly different results, among alternative measures.

Dellva, Demaskey and Smith (2001) examined selectivity and timing performance issues of the Fidelity sector mutual funds from 1989 to 1998. Three alternative models; Jensen (1989), Treynor and Marzuy (1966) and Henriksson and Merton

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[3] The Grinblatt and Titman's positive period weighting measure is obtained in two steps. First, selecting a vector of weights, $W_1, \ldots, W_t$. Each element of the vector corresponds to one time series observation. Second, taking the dot product of the weight vector and the excess return vector of the portfolio to demonstrate the performance of a fund, that is,

$$\textit{Positive weighting measure (PW)} = \alpha = \sum_t W_t R_{pt}$$

The weight vector is selected to have nonnegative weights that create the weighted sum of the excess returns of the benchmark portfolio sum to zero. If R_{it} represents period t excess return of the index portfolio used as a benchmark, that is $\sum_t W_t R_{it} = 0$, $W_t > 0$. The authors provided conditions under which positive values for these measure imply that the mutual fund manager has special information.

(1981) were employed. They also used three benchmarks; The S&P, the Dow Jones Industry Group Total Return Indexes, and the Dow Jones Subgroup Total Return Indexes. The results under the Dow Jones Industry benchmark indicate that many sector fund managers exhibit positive selectivity but negative timing ability. Findings also revealed that the results were sensitive to the choice of benchmarks and timing models.

2.3 Selectivity and Market Timing studies in Thailand

2.3.1 Selectivity performance

Empirical results on fund selectivity from Thailand conducted during the 1990s have shown that, even though using the same time period of study the findings were inconsistent. One found that equity funds outperformed the market (Bhovichitra 1996), indicating superior selection ability of fund managers. But Mainkamnurd (1996) study inferred that these funds underperformed the market portfolio.

As a developing capital market, some limitations in Thai studies can be noted. The predominant ones are usage (very) short time period of study (except the study by Jegasothy, Satjawathee, and Tippet 2005), the kind of proxy for the risk-free rate used and limited choice on benchmark returns. The table 2.3 in the chapter appendix presents the details of Thai studies on funds selectivity ability and their results. The selectivity ability of fund manager, in the last column, shows the status of performance (out-performed or under-performed) of an average fund (in a sample set) as compared to the market portfolio. Information on authors, duration of the study period, number

of funds in the sample set, model employing, market portfolio, appearance of survivorship bias, and concluding results are also presented.

2.3.2 Market timing performance

The Thai fund industry is relatively new and therefore testing market timing ability of mutual fund managers has received only little (academic) interest in the past. There are only two working papers focused on market timing performance so far. Lonkani (1996) applied Quandts' (1972) a two-regime switching regression approach to test the market timing performance of 12 mutual funds during the time period of August 1992-December 1995; 3 years and 4 months. Results revealed that among the 12 mutual funds six only showed some form of engagement in market timing but among the six only two funds the evidence was significant at 10 percent level. The validity of this study is very much limited by the shortness in the time period used.

Srisuchart (2001) examined the skills of fund manager, both selectivity and market timing abilities, using a variety of models developed by Jensen (1968), Treynor and Mazuy (1966), Henriksson and Merton (1981), Kon and Jen (1978), and Kon (1983). Monthly return adjusted by dividend from January 1990 to May 2000 of close-ended funds, fixed income funds, balanced funds and flexible funds were used in the study. The results provided mixed information. In market timing performance, the equity funds outperformed fixed income fund but the result was opposite under selectivity performance. However, the author conceded that findings of the study are constrained by the data collection, the period of study and regulatory restrictions on holding equity securities.

Recently, a study on market timing ability of Thai mutual fund market was conducted by Chunhachinda and Tangprasert (2005). Treynor and Marzuys' (1966) measure was employed to examine the market timing ability of 65 Thai open-end funds during 2001-2003. When weekly data were tested, 55 percent of 65 funds showed correct direction of market timing. Nevertheless, when monthly data were examined, only 12 percent of the sample set had the evidence of market timing ability. However, use of this study is also limited by the use of short time duration.

2.4 Introduction to Selected Models in this study

Investigation in this study also commences with employing the Jensen's fund performance measurement model to make deduction on fund selectivity and timing behaviour.

2.4.1 The Jensen Alpha model

The Jensen Alpha model (henceforth referred to as JA model) evaluates the abnormal fund returns by relating actual returns to expected returns through the systematic risk of the fund (Jensen, 1968). JA model is constructed solely using the capital asset pricing model (CAPM) as its conceptual basis. However, it incorporates fund manager's fund selection ability as a fixed component in the model. Assuming that the CAPM is empirically valid, the realized returns on any fund can be expressed as a linear function of its systematic risk, the realized returns on the market portfolio, the

risk-free rate and a random error. The structure of the JA model of portfolio performance is as follows:

$$R_{pt} - R_{ft} = \alpha_p + \beta_p [R_{mt} - R_{ft}], \quad t = 1, \ldots T \qquad (2\text{-}1)$$

where, R_{pt} = the rate of return for portfolio p in time period t.

R_{ft} = the risk-free rate in time period t.

R_{mt} = the expected return on the market portfolio in time period t.

α_p = the intercept term (*Jensen Alpha*) of portfolio p.

β_p = the systematic risk (*beta*) for portfolio p, and

The intercept term (α_p) that measures the deviation of portfolio return and known as the portfolio alpha reflecting the managers' selection behaviour. The slope term (β_p) expresses the degree of sensitivity or volatility of funds returns to the changes in the market return. A significant positive alpha infers that the fund manager is a superior forecaster or stock picker. If the fund manager is a superior forecaster with respect to a fund, the fund will earn more than the normal risk premium for its level of risk. In contrast, a negative alpha indicates that the fund manager is an inferior forecaster or stock picker. The zero alpha indicates that the fund performance does not different from the market portfolio performance. The downside of JA model estimates is that it only permits inference on the overall investment selection skill of a fund manager and thereby fails to explain the managers' timing ability. The timing aspect remains embedded in systematic risk.

Although the JA model has been the subject of various criticisms, such as the model is based on an upwardly-biased estimate of systematic risk for a market-timing

investment strategy (Grinblatt and Titman 1989b), it continues to be the most widely used measure in academic empirical studies (Grinblatt and Titman 1989b; Block and French 2002). A version similar to JA model was by Fama (1972) to focus on components of investment performance: selectivity and risk. As improvement Quandt (1972) introduced switching regression technique to the CAPM framework that enabled to examine the possibility of changing levels of market-related risk over time for mutual fund.

Measuring the time ability of a fund manager requires models with more filtering ability than the Jensen measure. Two procedures based on alternative conceptual arguments that accounts for the market timing ability are explained in the following sections, 2.4.2 and 2.4.3.

2.4.2 Treynor and Mazuy (1966) quadratic regression model

One of the earliest analyses of the market timing performance was conducted by Treynor and Mazuy (1966). They evaluated the market timing ability by testing the sensitivity of mutual funds to market cycles. They constructed a non-linear version of CAPM to test for market timing by introduing a *quadratic* term. The non-linear term is introduced on the basis of a convex relationship that is observed (theoriticaly) to at interface of portfolio and market returns. Hence, the behavioral pattern underlying Treynor and Mazuy model (henceforth referred to as TM model) implies that if the manager is able to forecast market returns successfully, he is likely to retain a higher proportion of market portfolio when the market return is high and vice versa.

The sturcture of the Treynor and Mazuy quadratic regression model is:

$$R_{pt} - R_{ft} = \alpha_p + \beta_{1p}[R_{mt} - R_{ft}] + \beta_{2p}[R_{mt} - R_{ft}]^2, \quad t = 1, \ldots T \qquad (2\text{-}2)$$

where, R_{pt} = the average rate of return for portfolio in time period t.

R_{ft} = the average rate of return on a risk-free investment in time period t.

R_{mt} = the average rate of return on the market portfolio in time period t.

α_p = the intercept term (similar to Jensen Alpha) of portfolio p.

β_{1p} = the pure systematic risk (beta) for portfolio p.

β_{2p} = the market timing coefficient for portfolio p

Positive value of β_{2p} indicates superior market timing ability while the negative value points to the inferior market timing ability. Insignificant β_{2p} implies that no excess return contributed by the timing ability of the fund manger. The intercept (α_p) represents the stock selectivity ability of the manager while β_{1p} now provides true systematic risk of the fund/portfolio p.

Subsequent to the work by Treynor and Marzuy (1966), researchers developed few more alternative selectivity and market timing evaluation measures. Among those the improvement made by Bhattacharaya and Pfleiderer (1983) was a significant one. Apart from isolating the market timing effect, the improved model also distinctly captures the forecasting skill of a manager. Coggin, Fabozzi and Rahman (1993) made further refinement to the Bhattacharaya and Pfleiderer version to account for negative timing.

2.4.3 Henriksson and Merton (1981) dummy variable regression model

Henriksson and Merton argue that fund managers' portfolio switching behaviour between equity funds and fixed interest options as valuable information in testing and explaining market timing behaviour. They introduced the switching behaviour as a dummy variable (Henriksson and Merton, 1981) in their model (henceforth referred to as HM model). The concept underlying the HM model states that a fund manager is likely to switch the portfolio between the equity and fixed interest markets, if he has the ability to predict whether the market return would be greater or less than the risk-free rate. Period during which the market return outperforms risk-free rate ($R_m > R_f$), the fund market experiences rising markets status. On the other hand the market return is less than risk-free rate ($R_m < R_f$) indicates a declining market status. Given these behavioural postulations, a successful market timer would select a high up-market beta and a low down-market beta in his decision process, to switch portfolio.

The usage of market status information is added to the HM model to exhibit the switching behaviour in the following way:

$$R_{pt} - R_{ft} = \alpha_p + \beta_{1p}[R_{mt} - R_{ft}] + \beta_{2p}[D(R_{mt} - R_{ft})], \quad t = 1,\ldots T \qquad (2\text{-}3)$$

where, R_{pt} = the average rate of return for portfolio in time period t.
R_f = the average rate of return on a risk-free investment in time period t.
R_m = the average rate of return on the market portfolio in time period t.
D = dummy variable with a value of -1 for a decline-market return ($R_m < R_f$) or zero otherwise ($R_m \geq R_f$).

In the above model structure, $E(R_p - R_f) = \alpha_p + \beta_{1p} E(R_m - R_f)$ indicates the rising market status. And, $E(R_p - R_f) = \alpha_p + (\beta_{1p} - \beta_{2p}) E(R_m - R_f)$ indicates the declining

market status. If value for β_2 is positive, it indicates a superior market timing ability while the negative value points to the inferior market timing ability. Even though the HM enables to verify timing ability based on the market status information, it does not clarify whether the available information is used properly or not (Dybvig and Ross, 1985).

Although the two market Timing models (Treynor and Mazuy 1996, and, Henriksson and Merton 1981) have advantage over the single parameter Jensen's model, the limitation of both measures is that they assume that the observed data will have only two stages/partitions. In practice, the fund managers will choose more than two stages of market movement for their decision-making (Srisuchart 2001).

2.5 Summary

This chapter has reviewed the literature that relates to selectivity and market timing performance of mutual fund. It started with selectivity and market timing definition and followed by an overall summary discussion of performance studies related to selectivity and market timing ability commencing with application of classical selectivity and market timing performance model. This discussion progressively introduced studies with model improvements and variations including those conducted since 1990s. Most of the studies infer no significant selectivity and market timing activities in portfolio management and the reasons for such an inference varied across the studies.

Only few studies have been conducted on selectivity and market timing in Thailand and the summary discussion of these studies highlighted the limitations in the analyses. Studies concede that validity of the results is mainly restrained by short sample time period and regulatory restrictions on holding equity funds. This summary envisages the need for a selectivity and market timing study in Thailand to at least overcome these two limitations. Although a number of alternative measures and variants have been developed, all these measures are not yet applicable to fund performance study in Thailand due to the incomplete nature of Thai fund data. Given this constraint, the final section of this chapter introduced the three compatible selectivity and market timing models. These models are Jensen Alpha, Treynor and Mazuy quadratic regression equation, and Henriksson and Merton dummy variable regression.

The next chapter provides the research methodology employed in this study. Introduction of three fund selectivity and market time models in estimable form, the procedure adopted in estimation and data used. In addition, three null hypotheses realted to three research questions of the study are set and relevant statistical tests are discussed.

The three measures discussed above are well-known measures; Jensen Alpha, Treynor and Mazuy quadratic regression equation, and Henriksson and Merton dummy variable regression, are traditionally used to measure selectivity and market timing performance for many decades. These three measures are employed in this study to examine selectivity and market timing performances of equity funds in Thailand.

Table 2.1 Summary of overall performance of selectivity performance studies

Authors	Year	Period covered	No. of funds	Type of Funds	Model	Market Index	Survivor bias[1]	Performance[2]
Sharpe	1966	1954 - 1963	34	All	Sharpe Ratio	The Dow-Jones Industrial Average (DJIA)	Yes	underperformed
Jensen	1968	1945 - 1964	115	All	Jensen Alpha	The S&P 500	Yes	1946 -1964: underperformed 1955 - 1964: underperformed
Carlson	1970	1948 - 1967	82	Common stock funds, Balance funds, and Income funds	Tobin - Sharpe - Lintner CAPM	The S&P500, NYSE, and DJIA	Yes	Most of funds outperformed the DJIA. A small number of funds outperformed the NYSE or the S&P500
McDonald	1974	1960 - 1969	123	All	Treynor , Sharpe , and Jensen measures	The equally weighted-NYSE composite index	Yes	Two-third of fund underperformed the market portfolio The more aggressive funds outperformed the more conservative funds
Mains	1977	1955 - 1964	70	All	Jensen alpha	S&P500	Yes	neutral performance
Kim	1978	1969 - 1975	138	All	Weighted Index Benchmark Portfolio approach	A three-index benchmark portfolio (Salomon Brothers' High Grade Corporate Bond Index, the NYSE, and Treasury bills)	Yes	underperformed
Shawky	1982	1973 - 1977	255	All	Treynor , Sharpe , and Jensen measures	The equally weighted-NYSE composite index	Yes	neutral performance
Grinblatt and Titman	1989a	1975 - 1984	274	Equity funds	Jensen measure and PPW model (Grinblatt and Titman 's model)	The value weighted - CRSP (New York and American Stock Exchange) , Equally weighted-NYSE , F10 (Lehmann and Modest 1988) , and P8 (Grinblatt and Titman 1988)	No	Aggressive-growth funds outperformed the market portfolio. Actual returned of all funds undeperformed the market portfolio
Malkiel	1995	1971 - 1991	724	Equity funds	CAPM	The S&P 500 and Wilshire 5000 stock index	No	underperformed
Block and French	2002	1989 - 1998	506	Common stock funds	Jensen Alpha and a two-index model (Block and French's model)	Wilshire 5000 stock index and equal-weighted indexes	Yes	underperformed
Bird, Chin and McCrae	1983	1973 - 1981	380	Australian Supperannuation funds	Treynor, Sharpe, and Jensen measures	The Statex Actuaries Accumulation index, the Adjusted Campell and Cook index, and the 20/30 index	Yes	Underperformed during 34 quarters (1973-1981). When funds were tested for 2 sub-periods, the fund performance of first 17 quarters was inferior, but superior to the market over the second 17 quarters
Robson	1986	1969-1978	76	9 Australian mutual funds 67 Australian unit trusts	Treynor, Sharpe, and Jensen measures	The Walter index and the Statex Actuaries Accumulation index	Yes	Underperformed during 1969-1978. When funds were tested for two sub-periods, the fund performance of 1969-1973 was superior, but was inferior to the market in 1974-1973.
Otten and Bams	2002	1991-1998	506	Equity funds from 5 countries (the UK , France, Germany, Italy, and Netherlands)	Four-factor model (Carhart 's model)	The researchers computed benchmark from all stocks that are in Worldscope universe for each country.	No	French, Italian, Dutch and UK funds outperformed but German Funds underperformed

Source: Adapt from Satjawathee (2004)

[1] **Survivorship bias** refers to the problems incurred in mutual fund studies due to the fact that poor performance funds are usually terminated while the skilled ones stay around (Alexander, Sharpe, Baily 2001). Examining fund performance of only survivor funds may lead to an overstated performance measurement (Elton, Gruber and Blake 1996a).

[2] Outperform refers to selectivity ability and underperform refers to poor selectivity ability.

Table 2.2 Summary of market timing performance studies since 1990s.

Study	Year	Period covered	No. of funds	Model	Market Index or benchmark	Survivourship bias	Performance
Lee and Rahman	1990	January 1997 – March 1984	93	Henriksson and Merton model, Bhattacharya and Pfleiderer (1993) model	CRSP value weighted index	yes	market-timing ability for individual level
Grinblatt and Titman	1994	31 Dec 1974 - 31 Dec 1984	279 funds + 109 portfolio	Jensen Alpha, Treynor and Mazuy model, Grinblatt and Titman (1989b) model,	Equally weighted index, factor portfolio benchmark, P8 benchmark	yes	market-timing ability
Ferson and Schadt	1996	1968 - 1990	67	Jensen Alpha, Treynor and Mazuy model, Henriksson and Merton model, CAPM, and Conditional CAPM (Ferson and Schadt 1996)	CRSP value weighted index	yes	Perverse market timing ability
Daniel, Grinblat, Titman, and Wermers	1997	31 Dec 1974 – 31 Dec 1994	2,500	Jensen Alpha, Characteristic-based approach, Grinblatt and Titman (1993),	CRSP value weighted index for Jensen measure, constructed benchmark portfolio for the rest measures.	no	Poor market-timing ability , however, results showed some selectivity ability
Beckers	1997	Feb 1981-Jan 1996	100	Monte Carlo simulation, Sharp Ratio	Capitalization -weighted portfolio (Morgan Stanley Capital International weighted)	yes	poor market-timing ability
Bello and Janjigian	1997	1984-1994	633	Extended Treynor and Mazuy model	S&P 500, Wilshire 4500 (exclude stocks in S&P500), Shearson Lehman Government Corporate Indexes	yes	Selectivity and market timing ability
Kao, Cheng, and Chan	1998	1989-1993	97	Jensen Alpha, Henriksson and Merton model	Morgan Stanley Capital International (MSCI) indexes	yes	poor market-timing ability
Busse	1999	2 Jan 1985 - 29 Dec 1995	230	Busse (1999)	S&P 500 Index	yes	market-timing ability
Goetzmann, Ingersill Jr., and Ivkovic	2000	1988-1998	558	Henriksson and Merton model, Adjusted test, HM-FF3 test, Adjusted HM-FF3 test	S&P 500, and 55 stock indexes	yes	poor market-timing ability
Umamaheswar Rao	2000	1987-1996	570	Henriksson and Merton model	Value weighted S&P 500 Index	yes	poor market-timing ability
Bollen and Busse	2001	2 Jan 1985 - 29 Dec 1995	230	Busse (1999), Adjusted HM-FF3 test(Goetzmann et.al 2000), Daniel et al. (1997), Carhart (1997)	S&P 500 Index	yes	Market-timing ability. Daily tests are more powerful than in monthly tests.
Dellva, Demaskey and Smith	2001	1989-1998	35	Jensen Alpha, Treynor and Mazuy model, Henriksson and Merton model	S&P 500, Dow Jones (both industry group and sub group Indexes	n.a.	Selectivity ability, but poor market timing ability

Table 2.3 Summary previous Thai fund performance studies

Study	Year	Period covered	No. of funds	Model	Market Index	Survivourship bias	Performance[1]
Kongcharoen	1992	June 1998 – Dec 1990	5	CAPM, Treynor, Sharpe	SET Index	yes	Outperform
Bhovichitra	1996	1992 -1995	15	CAPM, Treynor, Sharpe	SET Index	yes	Outperform
Mainkamnurd	1996	1992 -1995	51	Treynor, Sharpe, Jensen, Return, Excess return	SET Index	yes	underperform
Pornchaiya	2000	Jan 1996 – June 1999	77	CAPM	SET Index	yes	underperform
Jegasothy, Satjawathee, and Tippet	2005	1992 -2000	86	Treynor, Sharpe, Jensen, M^2, Return	SET Index	yes	underperform

[1] Outperform refers to selectivity ability and underperform refers to poor selectivity ability

Table 2.4 Summary previous Thai fund market timing performance studies

Study	Year	Period covered	No. of funds	Model	Market Index	Survi-vourship bias	Performance[2]
Lonkani	1996	Aug 1992 – Dec 1995	12	Quandts model	SET Index	yes	Underperform
Srisuchart	2001	Jan 1990 - May 2000	144	Treynor and Mazuy, Henriksson and Merton, Kon and Jen, Kon models	SET Index	yes	Equity fund outperformed Fixed Income funds
Chunhachinda and Trangpasert	2005	2001-2003	65	Treynor and Mazuy model	SET Index	yes	Outperform (when daily data were used) Underperform (when monthly data were used)

[2] Outperform refers to market timing ability and underperform refers to poor market timing ability