CHAPTER III

Data and Methodology

3.1 Data

The data are collected from DataStream from January 1996 to December 2005 period. The data compose of Asian countries (i.e. Thai stock market, Malaysia equity market, Singapore equity market, and Philippines equity market) including New York stock exchange (NYSE) as benchmark of study. The data compose of stock price, analysts' consensus recommendation, number of analysts following company, trading volume, book-to-market, and market capitalization.

For analysts' consensus recommendation data, the I/B/E/S databases recalculate the analysts' recommendation in every month. I/B/E/S categorized the recommendation into 5 levels, which are 'strong buy', 'buy', 'hold', 'sell' and 'strong sell'. The rating is coded by I/B/E/S between 1 and 5. A rating of 1 reflects a strong buy recommendation, 2 a buy recommendation, 3 a hold recommendation. 4 a sell recommendation, 5 a strong sell recommendation.

3.2 Research Hypotheses

Hypothesis 1: I/B/E/S mean consensus recommendation can provide the value to investors.

Analysts provide a conclusive note as investors should buy, hold, or sell stocks. Investors simply notice the type of recommendations and make a decision to invest according to the recommendation. If analysts' recommendation has value, investors can be benefit from the recommendation contributed by analysts.

Hypothesis 2: Portfolios that have low number of analysts' cover can outperform high analyst covered stocks.

One characteristic that analyst use to classify firms in the market can be found on the quality of "information dissemination". High analyst covered firms have high level of information dissemination. We should not observe abnormal return. However, low analyst covered firms have low level of information dissemination. We expect some insider effect to the recommendation news. In this circumstance, abnormal return should be found.

Hypothesis 3: I/B/E/S mean consensus recommendation can induce trading volume

The abnormal trading volume is also interest to examine since it can expose that investors use analysts' recommendation in order to make investment decision. Investors believe that analysts' recommendation has value. They will be trade follow analysts' recommendation. In this case, abnormal trading can be observed from the stock markets.

3.3 Methodology

3.3.1 Value of I/B/E/S analysts' consensus recommendation

To investigate hypothesis 1 that analysts' recommendation provide value to investors, we apply regression analysis approach in order to test the evidence that analysts' recommendation can predict the stock return. Following this equation:

$$RET_{i,t} = \alpha_{i,t} + \beta_{i,t} INDEX_{i,t} + \varepsilon_{i,t} \qquad (1)$$

Where

$RET_{i,t}$ = Monthly return for stock i

$INDEX_{i,t}$ = Monthly consensus recommendation rating score for stock i

To measure abnormal return from following analysts, constructing calendar-time portfolios first base on I/B/E/S analysts' consensus recommendation and using monthly data on I/B/E/S database to form characterize portfolios base on type of recommendations.

To construct portfolios of recommendations, we set the cutoff criteria of the average number in analysts' consensus recommendation rating score from type of recommendations. Five portfolios compose of the first one is for 'strong buy' portfolio [$1 \leq$ average recommendation rating < 1.5]; the second is comprised of 'buy' portfolio [$1.5 \leq$ average recommendation rating < 2.5]; the third contains stocks for which 'hold' portfolio [$2.5 \leq$ average recommendation rating < 3.5]; the fourth is comprised of stocks for which 'sell' portfolio [$3.5 \leq$ average recommendation rating < 4.5]; and the fifth portfolio consists of the least favorable recommendation change, those for which 'strong sell' portfolio [$4.5 \leq$ average recommendation rating ≤ 5].

After determining the composition of each portfolio, we calculate the monthly return for one stock given by:

$$R_{i,t} = \frac{R_t - R_{t-1}}{R_{t-1}} \qquad (2)$$

To calculate portfolio returns, we calculate the equal-weighted return for each portfolio on month t. This return is given by:

$$R_{pt} = \sum_{i=1}^{n} R_{i,t}/n \qquad (3)$$

Where

R_{pt} = the portfolio return at month t

n = amount of firms in portfolio

$R_{i,t}$ = The stock return for firm i at month t

To evaluate portfolio's performance, we employ the technique in measuring portfolio performance by using Carhart 4-factor model. The equation is below:

$$R_{pT} - R_{fT} = \alpha_p + \beta_p(R_{mT} - R_{fT}) + s_p SMB_T + h_p HML_T + m_p PR1YR_T + \varepsilon_{pT} \quad (4)$$

where

R_{fT} = The month T return on government bond

R_{mT} = The month T return on market return

SMB_T = The difference between the month T return of equal-weighted portfolio with small stocks and one of large stocks

HML_T = The difference between the month T return of equal-weighted Portfolio with high book-to-market stocks and one of low book-to-market stocks

$PR1YR_T$ = The difference between the equal-weighted month T average return of firms with the highest 30 percent return over the past 11 month and one of the lowest 30 percent return over the past 11 month

3.3.2 Number of recommendations

In addition, This paper further investigates our hypothesis 2 that stocks received low number of recommendation (less follow) will outperform stocks received high number of recommendation (well follow). In this section, we will separate all data into 2 categories base on number of recommendations. First, find the

benchmark criteria to divide well-followed companies and less-follow companies following this method.

$$BM = \frac{\sum_{i=1}^{n} NUMREC_i}{N} \quad (5)$$

Where

BM = Mean numbers of recommendation

NUMREC = Number of recommendation of each firm

N = Overall stocks in the market

If firm stocks received number of recommendations more than BM, we will group those data into the first categories. If firm stocks received number of recommendations lower than BM, we will group those data into the second categories. We will compare abnormal return portfolio of these two groups.

3.3.3 Trading Volume

To test hypothesis 3 that analysts' recommendation induce trading volume, Abnormal trading volume was measured by the ratio of daily trading volume in each recommended stock in the recommendation revision period to average trading volume in three month around revision period.

$$AV_{i,t} = \frac{V_{i,t}}{[\sum_{t=-2}^{-46} V_{i,t} + \sum_{t=2}^{46} V_{i,t}] \times \frac{1}{90}} \quad (6)$$

Where

$AV_{i,t}$ = Abnormal trading volume for stock i at day t

$V_{i,t}$ = Trading volume for stock i at day t

A ratio greater than one imply that relative recommended stocks were evidence of abnormal trading volume with recommendation. We use this equation to test abnormal trading volume for stocks in each portfolio base on revision recommendation. We further compare the different level effect of analysts' recommendation change on trading volume.

Aggregate trading volume for each portfolio

$$AV_{p,t} = \frac{\sum_{i=1}^{n} AV_{i,t}}{N} \quad (7)$$

Where

AVp,t = Abnormal trading volume for portfolio p at time t

N = Numbers of stocks in portfolio

We calculate overall trading volume for each portfolio and compare trading volume to other portfolios with different level of recommendation.

In conclusion, this study uses I/B/E/S mean consensus recommendation to provide the relationship between analysts' recommendation and stock returns. Moreover this paper investigate the value from analysts' recommendation and measure analysts' performance by constructing analysts' recommendation portfolios and evaluating portfolio performance. Investors can use method from this paper to bring out the benefit from analysts' recommendation.