CHAPTER 3

INCOMPLETE INFORMATION

I. DATA AND METHODOLOGY

According to Merton (1987)'s Model, the market is not complete. Information is not costless and is not available instantaneously to all investors, and only investors who know the information about the securities will trade on those securities. One of the methods the investors can obtain the information is through their brokers because the main functions of those analysts or brokers are to gather, collect, analyze, and disseminate the information to their customers. Jensen and Meckling (1976)'s theory states that the monitoring activities performed by analysts may help reduce the agency cost due to the separation of ownership and control, and this will finally increase the value of the firm. Alternatively, this may imply that investors' required rate of return from the firms that are not followed by analysts may be higher in order to compensate for the incurred agency cost. From these views, this study is going to use the number of analysts following the firm as a proxy for the investor base in Merton (1987)' Model. So far the only complete and internationally-accepted database about the analysts following the firm is from Institutional Brokers Estimate System (I/B/E/S). The lists of the names of all brokers following the Thai stocks from the I/B/E/S database is shown in Table 1*. Out of 46 companies shown, 5 of them are Thai brokers and sub-brokers namely Asia Securities Trading Public, Cathay Trust

*Matching the stocks followed by Thai with non-Thai brokers and perform the t-test to test the equality of mean of earnings per share made by each group, the result shows that the equality of mean of earnings per share cannot be rejected. This gives support to the data that there should be no much difference in forecasting between Thai and non-Thai.

Table 1
List of all Brokers/Analysts Following the Thai Stock on I/B/E/S Database from 1987 to 1998

Analysts following the firm is based on the analysts who make the forecasted earning per share for Thai firms from the period of 1987 to 1998. Panel A shows the names of Thai brokers. In Panel B, names of foreign brokers are listed.

Panel A: Thai Brokers
1. Asia Securities Trading Public Company
2. Cathay Trust Company Ltd.
3. Jardine Fleming Thanakom Securities Ltd.
4. Peregrine Nithi Finance & Securities
5. SCB Securities

Panel B: Foreign Brokers
1. ABN Amro
2. Anscor Hagedorn Securities, Inc.a
3. BZW Thailand
4. Cazenove and Company (Overseas) Ltd.
5. Clarion Securities
6. Credit Lyonnais Thailand
7. CS First Boston (HK) Limited
8. CSFB Europe Ltd
9. Databank Spa-Divisione Sasip
10. Deutsche Bank Securities
11. Dresdner Kleinwort Benson
12. Goldman Sachs (Europe)
13. Goldman Sachs Asia
14. HSBC Securities
15. HSBC Securities Asia Limited
16. Indosuez W.I. Carr Securities
17. ING Barings Thailand
18. ING Barings Research Malaysian Sdn Bhd
19. J.P. Morgan Securities Inc.
20. Kerry Securities Limited
21. Lehman Brothers Asia Limited
22. Merrill Lynch (Ex Snc) (Thailand)
23. Merrill Lynch (International Research)
24. Morgan Stanley Dean Witter
25. Morgan Stanley Pacific Basin

Table 1 *(continued)*

26. ONG & Company (Thailand)
27. Paribas Asia Equity Thailand.Ltd.
28. PT HG Asia Indonesia
29. Salomon Smith Barney
30. Salomon Smith Barney (HK) Ltd
31. SBC Warburg Dillon Read (Thailand)
32. SBC Warburg Dillon Read (Hong Kong)
33. Schroder Hong Kong
34. SG Securities
35. Standard Chartered Thailand
36. Sun Hung Kai
37. Vickers Ballas Investment Research Pte
38. Vickers Ballas Thailand Research
39. W.I. Carr Hong Kong
40. W.I. Carr Indonesia
41. Worldsec International Limited

Company, Jardine Fleming Thanakom Securities, Peregrine Nithi Finance & Securities, and SCB Securities*. Many brokers given in Table 1 are the foreign ones so in order to cover all the possible effects, both trading on Main Board and Foreign Board will be investigated. The Stock Exchange of Thailand (SET) maintains two separate listings for common stocks which have reached foreign ownership limits. The SET inaugurated its Foreign Board or Alien Board in 1987. For companies which have reached their foreign ownership limit, Thais continue to trade shares on the Main Board while foreigners submit order to the Alien Board. Foreign ownership of any Thai company is capped at 49%. Limits vary across industries and across firms within an industry, for example, the maximum foreign ownership limit is 25% for commercial banks and finance companies. Foreign investors who trade in the SET may learn the new information through their local brokers; therefore the effect of the incomplete information may be on the Foreign Board too. Table 2 shows the number of stocks followed by the different number of analysts starting from one analyst to the maximum of fourteen analysts. Analyst Following in the I/B/E/S database means analysts who make the forecasted earning per share of that stock. In this study, one-year forecasted period is selected. I/B/E/S started collecting data on Thai Stock Market in 1987 where there are 94 stocks followed by 1-3 analysts. In 1997, there are 443 stocks to be followed by 1 to 19 analysts. From Table 2, we can see that more brokers or analysts participate in this database which make this database more

* In 1997, many Thai brokerage companies are merged with the foreign ones, namely ABN Amro Asia Securities Trading Public Company from ABN Amro and Asia Securiites Trading Public Company; Merrill Lynch Phatra Securities Company from Merrill Lynch and Phatra Thankit Public Company; SG Asia Credit Public Company from SG Securities and Asia Securities Trading Public Co.,Ltd.; Nava Vickers Ballas Securities Company from Nava Finance and Securities Public Co.,Ltd.

Table 2
Number of Stocks Grouped by Number of Analysts Following the Firm

Analysts following the firm is based on the analysts who make the one-year forecasted earning per share for each firm in I/B/E/S Database. Number of stocks listed on Stock Exchange of Thailand are grouped according to the number of analysts who follow them each year. No analyst group is the one where the data are not shown in I/B/E/S Database or there is zero analyst following these firms. The period covered is from 1987 to 1997.

Number of Analysts	YEAR										
	87	88	89	90	91	92	93	94	95	96	97
No Analyst	8	28	89	93	12	10	28	19	4	28	16
1 Analyst	79	57	20	38	16	48	57	70	150	217	255
>1 and <=2	14	36	34	30	98	72	65	67	63	71	63
>2 and <=3	1	18	28	25	40	38	36	44	31	25	17
>3 and <=4			1	13	25	25	25	24	28	13	13
>4 and <=5				6	28	16	23	33	14	6	6
>57 and <=6				5	8	16	18	18	15	8	5
>6 and <=7					11	8	16	7	13	8	17
>7 and <=8					13	20	10	18	9	10	9
>8 and <=9					16	9	9	15	9	10	4
>9 and <=10					3	15	7	17	11	11	4
More than 10						28	54	58	70	48	50
Total Stocks	102	139	172	210	270	305	348	390	417	455	459

credible. However, to complete the study, robustness check is done by taking numbers of analysts following the firms from weekly surveys of brokers and sub-brokers' buying recommendations, conducted by Managers Information Services (MIS)*. 'Each week from Monday to Wednesday, MIS sampled approximately 15 brokers and sub-brokers and then asked them to choose five stocks for a one-week holding period and five stocks for a one-month holding period. The two groups of stocks could overlap. MIS treated Monday following the surveys as being recommendation dates. The surveys covered a period from March 7, 1994 to March 3, 1997. MIS employed these survey data to generate stocks for the "Hoon Wong Daeng" column in Hoon Thai. The publication is now discontinued. (Khanthavit (1998: 11)' In this study, only the one-month holding period stocks are used†.

A. The Interactive Effect of Firm Size and Incomplete Information

From the previous studies, there is still no definite empirical answer whether there is firm size or information effect or not and if there is any, how they interact. To examine the effects, by following the methodology done by Ding and Charoenwong (1996), three widely used portfolio formation models are used namely, the Within Groups (used by Banz (1981), Basu (1977)), Independent Groups (used by Reinganum (1981)), and Within Groups plus Randomization (used by Basu (1983)).

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* The author gratefully acknowledges the contribution of the data from Assistant Professor Dr. Anya Khanthavit from Thammasat University.

† Standardized number of analysts who follow the stocks are compared between two databases:-I/B/E/S and MIS. The correlation is significant at 24.4%. This sheds some lights that though I/B/E/S is dominated by foreign brokers but the direction of stocks being followed is the same for Thai and non-Thai Brokers.

Portfolios simply formed by ranking either only on analysts following the firm or market values of the firms are also done. Three types of excess returns are employed – Comparison Returns, Market-Adjusted Returns, and Market Model Returns. Following the previous studies (Banz (1981) and others), market value of the firm will be used as the proxy for the firm size. Based on Merton (1987) and Jensen and Meckling (1976), and studies done by Arbel, and Strebel (1982) and others, number of analysts following the firms will be used as the proxy for the incomplete information. Data for the daily monthly return and market value of firms on Main Board are taken from the database of the Pacific Basin Capital Market (PACAP) Research Center at the University of Rhode Island for the years 1989 through 1995 and from the Stock Exchange of Thailand for 1996. Monthly return* and market value of firms on Foreign Board from 1989 to 1996 are taken from the Stock Exchange of Thailand. Return from 1989 through 1991 are used as the first group of base period, and the actual data used are from 1992 to 1996.

The data on number of analysts following the firm are taken from I/B/E/S International Summary and Detail data. Monthly summary statistics for one-year forecast are used from 1992 to 1996.

To measure the information and firm size effect and the interactive effect between them, number of analysts following the firm will be used as the proxy for the information and the proxy for firm size will be the market value of each firm. And

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* Returns from the Foreign Board are the average returns from the average value traded over volume trade.

the portfolio will be formed by ranking the securities according to the control variable which is either number of analysts or market value.

For the first method of portfolio formation – the Within Group method, following the study done by Arbel and Strebel (1983), each year the portfolios are formed at first by the annual mean of number of analysts following the firm into 3 groups as :- zero or one analyst, more than one but less than or equal to three analysts, and more than three analysts. Then, within each portfolio, three equal-sized portfolios are formed namely small, medium, and large. This will result in 9 portfolios and the portfolios will be updated annually. The procedure will then be repeated by forming portfolio according to the market value first, and then by the number of analysts following the firm. And then we examine the effect of firm size, the effect of information, and the interaction effect between the two.

The Independent Group method divides the securities into 3 similar classes of number of analysts as in the Within Group, and at the same time they are also divided independently into 3 equal-sized portfolio. The securities that there is zero or one analyst followed and at the same time are classified as small size will be grouped as the first portfolio, then the ones that have more than one to three analysts and are medium-size will be grouped as the second portfolio, and so on. This will also result in 9 portfolios.

For the third method of portfolio formation, the Within Groups plus Randomization Method, the portfolios from the Within Group Method will be

combined. For the portfolios that are first classified by number of analysts and then by size, all the portfolios that have the same size will be combined. This will result in 3 portfolios. For the portfolios that are first classified by size and then by number of analysts, all the portfolios that have the same number of analysts will be combined, and it will result in 3 portfolios.

The monthly excess return is calculated by subtracting the expected return from the realized portfolio return. The realized return is the portfolio monthly returns with cash dividend reinvested of the common stocks in PACAP* and Stock Exchange of Thailand. The first method to find the expected return is called Comparison Returns Method by using the average portfolios return in base period. The average return of the first base period from 1989 to 1991 is subtracted from the realized portfolio return in 1992. The excess return of 1993 is measured by subtracting the average return of the second base period from 1990 to 1992 from the realized return in 1993, and so on.

The Market-Adjusted Returns Method is the second method for the expected return by using the contemporaneous market return. Monthly market return is defined

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* Monthly Returns with Cash Dividends Reinvested from PACAP are calculated as

$$MRETWD(t) = \{CLSPRC(t)*AMOUNT(d) * [1 + AMOUNT(r)] + AMOUNT(c)\}/\{CLSPRC(t-1) + [SUBPRC * AMOUNT(r)]\} - 1$$

where CLSPRC(t) = closing price at month t,
CLSPRC(t-1)= closing price at month t-1,
AMOUNT(c) = cash distributions with $(t-1) < DTEXDI \leq t$,
AMOUNT(d) = number of shares that one share at month t-1 becomes at month t with $(t-1) < DTEXDI \leq t$,
AMOUNT(r) = allocation rate for rights offering with $(t-1) < DTEXDI \leq t$,
SUBPRC = subscription price for rights offering, and
DTEXDI = ex-distribution date

as the returns of all common stocks included in PACAP and Stock Exchange of Thailand. And the returns used are the monthly equally weighted market returns with cash dividend reinvested.

The Market Model Returns Method is done by regressing the portfolio returns against the market returns in a base period to obtain the regression parameters to be used in a holdout period. A typical regression is :

$$R_{p,t} = \alpha_p + \beta_p R_{m,t} + \varepsilon_{p,t}$$

where $R_{p,t}$ stands for the monthly portfolio return in the base period

α_p ,β_p are the regression parameters

$R_{m,t}$ denotes the monthly market return in the base period

$\varepsilon_{p,t}$ is a random error term

Regression parameters estimated in the first base period (1989 to 1991) are applied to the realized market returns in 1992, which is the holdout period. Expected portfolio returns in 1993 are consequently determined in this manner. The procedure is repeated for each year with a new base period. (Ding and Charoenwong (1996: 254-255).)

January effect will also be investigated by subdividing the portfolios into January and non-January and grouping the returns accordingly to see whether the January return is higher than the other months or not.

Finally, the means of each portfolio is compared by using ANOVA technique and Duncan's multiple-range test on all main effect means to make the comparisons of means statistically.

B. The Tests on the Capital Asset Pricing Model

From the study of Blume and Friend (1975) who find out that even though investors hold assets in the form of portfolio, their holdings are markedly not diversified. Based on their result, this study is going to employ the annual time-series, cross-sectional data of each stock, not by portfolio, for the period of 1992 to 1996 to investigate the effect of each variable other than the systematic risk on the expected return. Also because of the characteristics of some variables i.e. price-to-book ratios, study by grouping the stocks into portfolios may provide inconclusive results and will not be appropriate.

From the literature, Merton (1987) and others find that :

$$R_k - R = f(\beta_k^{+}, \sigma^2_k{}^{+}, x_k^{+}, q_k^{-})$$

Assume linear function, we then get,

$$R_{ki} - R_f = \theta_0 + \theta_1\beta_{ki} + \theta_2\sigma^2_{ki} + \theta_3 Size_{ki} + \theta_4 \text{ Investor Base }_{ki} + e_{ki}, \qquad (1)$$

and the null hypothesis set is that all parameters (θ_1, θ_2, θ_3,θ_4) equal zero.

R_{ki} stands for the realized return of stock k in year i. Annual risk-free rate of return (R_f) is proxied by the average three-month times deposit rate of the largest four banks, namely Bangkok Bank, Thai Farmers Bank, Krung Thai Bank and Siam Commercial Bank.* The systematic risk (β_{ki}) and the firm-specific risk (σ^2_k) will be taken from the Market Model. Following Marston (1996), size or fraction of the market portfolio invested in security k (x_k) is proxied by the natural log of market value of each firm over the overall market values of all stocks in the SET each year. Also for the investor base or fraction of all investors who know about security k (N_k/N), the number of analysts following a given firm relative to the maximum number of analysts following any firm in the sample for that year will be used. The number of analysts following the firms will be taken from both I/B/E/S and MIS Database.

From the market model, $R_{k,t} = \alpha_k + \beta_k R_{m,t} + \varepsilon_{k,t}$ where $\varepsilon_{k,t}$ denotes the residual return, assumed to be serially and cross-sectionally independent and also independent of R_{mt}. The firm-specific or the residual risk (σ_k) of stock k is the standard deviation of the market-model residuals : $\sigma_k = \sigma(\varepsilon_{kt})$. For each year, the parameters β_k and σ_k are calculated by regressing the daily return of each security against the daily market return of the same period.

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* Three-month times deposit rate is used as the risk-free rate. It is considered risk-free because the return is guaranteed by the government, as evidenced by the failure of many banks in 1997, the depositors still get their money back. The times deposit rate is more volatile than the repurchase rate; the standard deviation of times deposit rate is 1.4 while the REPO rate is about 0.7.

To test Merton (1987)'s model whether the systematic risk, the firm-specific risk, size and investor base have any effect on the expected return, the ordinary least squares will be employed with the null hypothesis that there is no relationship between those variables and the expected return.

To complete the study, Fama and French (1992)'s model will also be explored by combining with the incomplete information effect. This means that the test on all variables of Merton (1987)'s model; the systematic risk, the firm-specific risk, the fraction of market portfolio invested in the firm's security, and the fraction of all investors who know about the firm's security, and new variables from Fama and French (1992)'s model; price-to-book value of equity (PB), debt ratio, price-earnings ratio (PE), will be investigated. Again assume linear relationship between the variables and the expected return, the following equation will be estimated using ordinary least square method:-

$$R_{ki} - R = \theta_0 + \theta_1\beta_{ki} + \theta_2\sigma^2_{ki} + \theta_3 Size_{ki} + \theta_4 \text{ Investor Base}_{ki} + \theta_5 PB_{ki} + \theta_6 Debt_{ki} + \theta_7 PE_{ki} + \varepsilon_i$$

The natural log of price-to-book value of equity is used. Debt ratio uses the long-term liability over total assets. Because of the nature of high liquidity in Banking, Finance and Insurance Industry, all the firms in Finance, Banking and Insurance Industry will be excluded from the sample. Following Fama and French (1992), all the accounting data in year t-1 (1991 to 1995) will be used to match with the return in year t (1992 to 1996).

The null hypothesis is that all the estimators are zero, or there is no relationship between the variables and the expected return.

Because of the pooled time series and cross-sectional data, the variance or error components will be taken care of by the Fuller-Battese method. The variance components are estimated by the fitting-of-constants method, and the regression parameters are estimated with generalized least squares(GLS.) The variance components models are:-

$$y_{it} = \sum_{k=1}^{p} X_{itk}\,\beta_k + u_{it};$$

where $u_{it} = v_i + e_t + \varepsilon_{it}$

v_i stands for the individual or cross-sectional random effect

e_t stands for the time-specific or time-series random effect

and ε_{it} stands for the error disturbance or combined error

C. Factors affecting the Costs of Incomplete Information

Merton (1987) develops the incomplete information model and finds out that it incurs cost of incomplete information where the cost of incomplete information is function of firm-specific risk, portion of market values invested in stock k, and the fraction of investors who invest in security k:-

$$\bar{R}_k - R_f = \delta \cdot Var(\tilde{R}_m)\beta_k + \lambda$$

where $\lambda_k = (1-q_k).x_k\delta\sigma^2_k/q_k$=the cost of incomplete information,

R_k = the firm k's return

R_f = risk free rate of return

δ = the penalty for risk arising from risk aversion in the utility function;

Var (R_m) = variance of market return,

$x_k = V_k/M$ = the fraction of the market portfolio invested in security k;

σ^2_k = the firm- specific or residual risk of firm k;

$q_k = (N_k/N)$ = the fraction of all investors who know about security k

$(0<q_k\leq 1)$

According to the empirical studies of aggregate risk aversion done by Friend and Blume (1975) and Mehra and Prescott (1985 p. 154), they suggest that δ =2. Var(Rm) is the variance of the daily market return each year. The other variables are defined as in the previous section.

Merton (1987) finds the positive relationship between the cost of incomplete information and firm-specific risk, the fraction of market portfolio invested in security k, and negative relationship with the fraction of investors who know about security k:-

$$\lambda_k = f(\sigma^2_k{}^{+}, x_k^{+}, q_k^{-})$$

By assuming linear relationship, the following model will then be estimated :

$$\lambda_k = \eta_0 + \eta_1 \text{ firm-specific risk} + \eta_2 \text{ size}_k + \eta_3 \text{Investor Base}_k + e_k, \quad (1)$$

and the null hypothesis set is that all parameters (η_1, η_2, η_3) are equal to zero. The sample covers the period of 1992 to 1996.

D. Descriptive Statistics

Table 3 shows the descriptive statistics for all the variables used in this study. The mean return on the Main Board* is –0.00626 while on the Foreign Board is –0.02206. The standard deviation of return on the Foreign Board (0.1479) is double of what is on the Main Board (0.0763.) The average market return for the year 1992 to 1996 turns to be positive. The average number of analysts following the firm is about 4 where there is only one analyst following the firm upto 25th percentile. Market values of firms range from 240 million baht in the 5th percentile to 32,040 million baht in the 95th percentile. On average, there are about 10 institutions holding the firms'share or about 40 percent of shares are held by institutions. Price to Book Value of Equity ranges from 0.54 in the 5th percentile to 7.16 in the 95th percentile. The mean price-earnings ratio is at 29.16. Table 4 shows the Pearson Correlation between various variables used in this study. Size and number of analysts from I/B/E/S database are highly correlated (74.87%) significantly.

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* Mean returns and market return in year 1992 and 1993 are positive, while in 1994, 1995 and 1996, mean returns turn to be negative

Table 3

Descriptive Statistics -Annual Data

Annual returns are the average of monthly returns where monthly returns with Cash Dividends Reinvested, taken from PACAP Database and Stock Exchange of Thailand, are calculated as:

$$MRETWD(t) = \{CLSPRC(t) * AMOUNT(d) * [1 + AMOUNT(r)] + AMOUNT(c)\}/\{CLSPRC(t-1) + [SUBPRC * AMOUNT(r)]\} - 1$$

where
- CLSPRC(t) = closing price at month t,
- CLSPRC(t-1) = closing price at month t-1,
- AMOUNT(c) = cash distributions with $(t-1) < DTEXDI \leq t$,
- AMOUNT(d) = number of shares that one share at month t-1 becomes at month t with $(t-1) < DTEXDI \leq t$,
- AMOUNT(r) = allocation rate for rights offering with $(t-1) < DTEXDI \leq t$,
- SUBPRC = subscription price for rights offering, and
- DTEXDI = ex-distribution date

Annual returns of both the Main Board and the Foreign Board are shown. Annual market return, also from PACAP Database and Stock Exchange of Thailand are calculated from the average of monthly market returns of each year. Monthly market returns are calculated with cash dividends reinvested for an equally weighted market portfolio. The weight is 1/ number of stocks in the market. Analysts (I/B/E/S) is the number of analysts making one-year forecasted earnings per share taken from I/B/E/S Database. Market Values are taken from PACAP Database and Stock Exchange of Thailand. It is the average monthly market value of individual stocks at the end of the trading month. Monthly market value is the product of last closing price of the trading month and number of shares outstanding at month end. If no trading occurs during the month, previous month's market value is carried forward. The number shown is in millions of Baht. Number of institution (No. Institution) is the number of major institutional holders, and Percentage of Institution (% Institution) is the percentage of institutional investors holding the firm's stock. PB is the ratio of price to book value of equity. PE is the ratio of price to earnings of the firm. Debt is the long-term debt ratio.

					Percentile			
Variable	Period	Mean	S.D.	Median	5	25	75	95
Return(Main)	92-96	-0.00626	0.0763	-0.0033	-0.0912	-0.0334	0.0217	0.0906
Return (Foreign)	92-96	-0.022057	0.14785	-0.009	-0.14752	-0.047612	0.028125	0.16162
Market Return	92-96	0.0013	0.0767	-0.0027	-0.1074	-0.0507	0.0384	0.1517
Analyst (I/B/E/S)	92-96	4.38	4.3096	2.25	1	1	6.75	13.33
Market Value	92-96	7176	20278	1628	240	703.5	4625	32040
No.Institution	92-96	9.807	6.091	9	2	5	13	20
% Institution	92-96	35.9633	21.841	34.73	4.78	16.38	52.85	72.73
PB	92-96	2.7213	2.6269	2.04	0.54	1.18	3.3	7.16
PE	92-96	29.1568	105.931	14.54	0.93	8.41	24.78	68.93
Debt Ratio	92-96	0.14788	0.1468	0.0961	0.00194	0.02975	0.23082	0.4512

Table 4

Correlation Analysis on the Variables for Regressions based on Merton's Model and Fama & French's Model on the Main Board

Merton's Model uses the Regression of the Annual Return (R_k) over risk-free rate(R_f) on the Systematic Risk (beta) , the Residual Risk (Sigma), Natural Log of Market Value of the Common Stock (Size), and the Investor Base. Investor Base uses analysts following the firm from I/B/E/S Database (Pana). Fama & French (1992) regress the Annual Return over Risk-Free rate (R_k-R_f) on the Systematic Risk(beta), the Residual Risk (Sigma), Natural Log of Market Value of the Common Stock (Size), Natural Log of Price to Book Value of Equity (PB), Price-Earnings Ratio(PE), and Debt Ratio (Long-term Liability over Total Asset). The variable of Investor Base is added into this model. Investor Base is proxied by the Number of Analysts following the firm. Samples are from year 1992 to 1996. In the parentheses, p-values of the hypothesis that correlation equals zero are shown. Finance, Bank, and Insurance Sectors are excluded for Price-to-Book value of equity, Price-earnings and debt ratio.

	Return	Beta	Sigma	Size	Pana	PB	PE
Beta	0.19697***						
	(0.0001)						
Sigma	-0.00418	-0.05032**					
	(0.8269)	(0.0374)					
Size	0.21802***	0.36076***	-0.30598***				
	(0.0001)	(0.0001)	(0.0001)				
Pana	0.17749***	0.18271***	-0.22071***	0.74863***			
	(0.0001)	(0.0001)	(0.0001)	(0.0001)			
PB	0.16122***	0.25055***	-0.13778***	0.38896***	0.20816***		
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)		
PE	-0.00198	0.28523***	-0.00293	0.03658	0.11525***	0.11859***	
	(0.9474)	(0.0001)	(0.9225)	(0.2550)	(0.0003)	(0.0002)	
Debt	-0.04447	0.15294***	-0.10635***	0.30995***	0.26525***	0.17512***	0.03377***
	(0.1387)	(0.0001)	(0.0004)	(0.0001)	(0.0001)	(0.0001)	(0.2934)

* denotes the 10 percent significant level.
** denotes the 5 percent significant level.
*** denotes the 1 percent significant level.

II. EMPIRICAL EVIDENCES

A. Firm Size Effect and Information Effect

Merton (1987) says that the expected return is an increasing function of the firm size or the fraction of market portfolio invested in the firm's stock. However, Banz (1981), Reinganum (1981, 1982 , 1983), Keim (1983), and others find the opposite result that there exists the firm size effect where small firms earn higher risk-adjusted returns, on average, than large firms. Arbel (1982), Arbel and Strebel (1983), Arbel, Carvell and Strebel (1983), Arbel (1985), and Merton (1987) find the information effect. By using number of analysts following the firm as the proxy for the information, they find that number of analysts following the firm has the negative relations with the common stock return. Their result is consistent with Barry and Brown (1983, 1984) who find that the stock with little information available is perceived as riskier securities ; therefore more premium will be required from those stocks. January effect is also discovered that return in January seems to be higher than in the other months of the year (Brown, Kleidon, and Marsh (1983), Keim (1983), and others.) They try to explain that the January effect is the result of firm size effect. However, Strebel (1983) and Arbel (1985) argue that it is not the size but information that matters.

This section is then to investigate the firm size effect, the information effect and the January effect by dividing into the effect on Main Board and Foreign Board. Table 5-8 show the result on the Main Board where data on analysts following the firm are from I/B/E/S Database. The results on Foreign Board are shown in Table 9-

12. Using the different methods of finding the excess return, namely the comparison method - compared with its own previous mean , the market-adjusted model-compared concurrently with the market return, and the market model where the risk is considered. The results for each method turn to be different. Portfolios are also grouped by 4 different methods. The first one is the Independent Method where the stocks are grouped independently by each control variable (size, number of analysts). Stocks with the lowest number of analysts and are the small size are classified as portfolio one, the second portfolio contains the lowest number of analysts with the medium size, and so on. The total number of portfolio is nine. The second one is the Within-Group Method where the stocks are ranked first by the number of analyst and then divided into 3 groups equally and within each group of analyst, the stocks are then reclassified into 3 groups of size. This also results in nine portfolios. The last one is the Within-Group Plus Randomization Method. The portfolios with the same size across different number of analysts are grouped together, also ones with the same number of analysts across the different firm size are grouped together. This results into three each. The last method is just simply grouping the stock independently either by number of analyst or by market value resulting in 3 portfolios each. The results of different portfolio formation methods are different. This leads to the conclusion that the results are subject to the different method of calculating returns and also the different methods of portfolio formation.

A.1 Effect on the Main Board

Table 5 to table 8 show the results using I/B/E/S Database as the proxy for number of analyst following the firms. Table 5 shows the excess abnormal returns of portfolios formed by within-groups method having number of analyst as the first control variable. None of the comparison methods shows the information effect. However, all of the sizes in January, non-January and all months of the market-adjusted method and market model method show the information effect consistently where the high number of analyst portfolio shows the highest abnormal return, except non-January of medium size of the market adjusted method and large size of the market model method shows the opposite. For the small-firm effect, the result is very robust by the comparison method. All of the portfolios in January, non-January, and all months of all sizes show that the abnormal returns of the larger firms are lower than the smaller ones. However, the results by the market-adjusted method is conflicting. In January of all groups of number of analyst, it is shown that the larger firms earn higher abnormal return, where the non-January of the low analyst shows the opposite result. The small-firm effect is also very strong by the Market model method. All the portfolios in January, non-January and all months show the small-firm effect where the smaller firms offer the higher abnormal return except the January and non-January of high analyst and all months of medium analyst show the opposite. For the January effect, it is shown in only the medium and large size with low analyst in Comparison method, in medium size with high analyst in Market-adjusted method, and large size with high analyst in Market model.

Table 6 shows the excess abnormal returns of the portfolios formed by independent method.* In Panel A, after controlling for the firm size, the information effect occurs for the Comparison Method in non-January, and all months of the small size, in January, Non-January, and all months of medium size, and non-January and all months of large size where the high number of analysts shows higher abnormal return. This is contradict to Arbel (1985), Merton (1987), and others. In January of the small portfolio, the information effect where the high number of analysts group gives the lowest abnormal return is shown. Controlling for the number of analysts following the firm, the firm size effect where the large size gives the lowest abnormal return is consistently shown in the Comparison method in non-January of low analyst, in January, non-January, and all months of medium analyst number, and in non-January and all months of the high analyst. The Market-adjusted method is used in Panel B, the information effect where the high number of analyst give the highest abnormal return is also found in January and all months of small size, and January of the medium size. However, in January of the large size, the information effect shows that the high number of analysts gives the lowest abnormal return. The small-firm effect where the smaller firms give higher abnormal return is found in January of the large analyst. However, in non-January of the medium analyst, the larger firms give higher abnormal return.

For the Market Model method in panel C, the information effect where the high number of analyst gives the highest abnormal return is consistently shown in non-January and all months of the small size, in January, non-January, and all months

* The result from independent method is exactly the same as the within-group method having market

of the medium size, and in January of the large size. The small-firm effect is shown in January, and all months of the small analyst, and in all months of the large analyst. Again, in January, the large analyst shows the opposite result. January effect where January abnormal return is obviously higher than the other months of the year is detected only in the large size of the low analysts group.

Table 7 uses the Within-group plus randomization method. Panel A groups abnormal return by number of analyst. Based on independent method, the high number of analyst portfolio show the higher abnormal returns. The results are consistently shown by the Market-adjusted and Market model method, while there is no such a pattern in Comparison method. Based on Within-group method, no information effect is shown by Comparison method. However, in January of Market-adjusted and Market model and non-January of Market model show the information effect where the high portfolio with high number of analyst give the highest abnormal return. January effect is found only in medium number of analyst by Market model. Panel B shows the results grouped on market value of the firms. Based on independent method, with the Comparison method, the small-firm effect where the large firms offer lowest abnormal returns is very robust. The small-firm effect is also shown by Market model in non-January and all months. However, the result on market–adjusted method is also robust but in the opposite way where the higher abnormal returns are from the larger firms. Based on within-groups ranked by number of analyst first, the small-firm effect is very robust by Comparison and Market model. Again, the market-adjusted method gives the robust result that larger firms

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value of the firms as the first control variable so only independent method will be reported.

Table 5
Excess Returns by Various Methods for Within-Groups Method having Number of Analysts as the First Control Variable on the Main Board

Monthly Excess Portfolio Returns are calculated by taking the difference between the realized and the expected returns by various methods. In Panel A, the Comparison Method is employed. Market-Adjusted Method is in Panel B, and Panel C shows the Market Model Method. Portfolios are formed by the Within-Groups Method having Analysts Mean as the first control variable Stocks are first ranked by Number of Analysts Following the Firm by having less than or equal to one analyst as the Low Port, more than one but less than or equal to three analysts as the Medium Port and the High Port contains more than three analysts. Within each port, stocks are then ranked by Market Value and subdivided into three equal portfolios namely Small, Medium and Large. There are totally 9 portfolios. Returns for January, non-January, and all months are also investigated. Returns and Market Values of all stocks traded on the Main Board are taken from Stock Exchange of Thailand and PACAP and Number of Analysts are from I/B/E/S Database from 1992 to 1996.

Rank on Analysts Mean	Rank on Market Value								
	Small			Medium			Large		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
				Panel A: The Comparison Method					
Low	-0.03166	-0.019296	-0.020341	-0.03383	-0.039698	-0.039205	-0.05320	-0.062446	-0.061670
Medium	-0.03285	-0.008358	-0.010379	-0.03843	-0.017197	-0.018954	-0.05621	-0.030062	-0.032210
High	-0.02400	-0.010546	-0.011671	-0.03003	-0.026266	-0.026581	-0.04124	-0.035312	-0.035807
				Panel B: The Market-Adjusted Method					
Low	-0.04063	-0.007637	-0.010427	-0.03476	-0.020849	-0.022018	-0.03500	-0.019146	-0.020477
Medium	-0.02217	-0.004208	-0.005689	-0.02270	-0.006912	-0.008219	-0.01314	0.005987	0.004416
High	-0.01111	-0.004012	-0.004605	-0.00492	-0.008593	-0.008285	0.00748	0.006687	0.006753
				Panel C: The Market Model Method					
Low	-0.02120	-0.000117	-0.001899	-0.02433	-0.017376	-0.017960	-0.04648	-0.022896	-0.024876
Medium	-0.01111	0.004724	0.003418	-0.01666	-0.005520	-0.006442	-0.02270	-0.008235	-0.009424
High	-0.00688	0.005002	0.004009	-0.01179	-0.004841	-0.005424	-0.00907	-0.009435	-0.009404

Table 6
Excess Returns by Various Methods for Independent Method or Within-Groups Method having Market Value of the Firm as the First Control Variable on the Main Board

Monthly Excess Portfolio Returns are calculated by taking the difference between the realized and the expected returns by various methods. In Panel A, the Comparison Method is employed. Market-Adjusted Method is in Panel B, and Panel C shows the Market Model Method. Portfolios are formed by the Independent Method which results in the same way as Within-Groups Method having Market Value as the first Control Variable. For the Independent method, stocks are ranked by market value first and then divided into three equal portfolios namely Small, Medium and Large. Stocks are also ranked independently by Number of Analysts Following the Firm by having less than or equal to one analyst as the Low Port, more than one but less than or equal to Three analysts as the Medium Port and the High Port contains more than three analysts. Then, stocks that fall in small group of number of analyst and small size are grouped together and so on, resulting in 9 portfolios totally. Returns for Non-January, January, and all months are also investigated. Returns and Market Values of all stocks traded on the Main Board are taken from Stock Exchange of Thailand and PACAP, and Number of analysts are from I/B/E/S database from 1992 to 1996.

Rank on Number of Analyst	Rank on Market Value								
	Small			Medium			Large		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
				Panel A: The Comparison Method					
Low	-0.02981	-0.028089	-0.028235	-0.06313	-0.050534	-0.051588	-0.04213	-0.087045	-0.083302
Medium	-0.03107	-0.008233	-0.010124	-0.04974	-0.021509	-0.023831	-0.05551	-0.037698	-0.039164
High	-0.04224	-0.001545	-0.004950	-0.01901	-0.016940	-0.017114	-0.03708	-0.032439	-0.032827
				Panel B: The Market-Adjusted Method					
Low	-0.03675	-0.013810	-0.015749	-0.05826	-0.021073	-0.024185	0.01241	-0.014451	-0.012212
Medium	-0.01499	-0.005741	-0.006507	-0.02939	-0.000585	-0.002953	-0.00906	0.005213	0.004038
High	-0.01336	0.001577	0.000327	-0.00007	-0.007396	-0.006782	-0.00240	0.000452	0.000215
				Panel C: The Market Model Method					
Low	-0.01976	-0.007732	-0.008749	-0.05613	-0.020908	-0.023856	-0.02053	-0.032140	-0.031172
Medium	-0.00672	0.002066	0.001339	-0.02719	-0.007139	-0.008788	-0.02054	-0.006750	-0.007885
High	-0.00774	0.013228	0.011473	-0.00023	0.000431	0.000376	-0.01441	-0.008237	-0.008752

Table 7
Excess Returns by Various Method
for Within-Groups Plus Randomization Method on the Main Board

Monthly Excess Portfolio Returns are calculated by taking the difference between the realized and the expected returns. The expected returns are calculated by various methods:- the Comparison Method - compared with its own mean of the previous periods, Market-Adjusted Method - compared with contemporaneous market return, and Market Model Method - by taking the risk into consideration. Returns for January, non-January, and all months are also investigated. In Panel A, Portfolios are grouped across different sizes but under the same portfolios of low, medium and high number of analysts from Independent Method or Within-Groups Methods ranked by Market Value first, and from Within-Groups Method ranked by number of analysts first. In Panel B, Portfolios are grouped across different number of analysts but under the same groups of size also from Independent Method or Within-Groups Method ranked by Market Value first, and from Within-Groups Method ranked by Number of Analysts first. Data are from 1992 to 1996 on the Main Board.

	Comparison			Market-Adjusted			Market Model		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
Panel A: Grouped by Number of Analyst									
Based on Independent Method or Within-Groups Method Ranked by Market Value first									
Low	-0.040414	-0.041371	-0.041290	-0.036804	-0.015891	-0.017651	-0.029828	-0.014302	-0.015609
Medium	-0.042717	-0.018793	-0.020766	-0.019357	-0.001731	-0.003185	-0.017072	-0.003088	-0.004241
High	-0.031750	-0.024099	-0.024739	-0.002815	-0.001975	-0.002045	-0.009078	-0.003124	-0.003622
Based on Within-Groups Method Ranked by Number of Analysts first									
Low	-0.039404	-0.040317	-0.040240	-0.036804	-0.015891	-0.017651	-0.030482	-0.013425	-0.014860
Medium	-0.042495	-0.018585	-0.020557	-0.019357	-0.001731	-0.003185	-0.016843	-0.003068	-0.004204
High	-0.031791	-0.024129	-0.024769	-0.002815	-0.001975	-0.002045	-0.009269	-0.003145	-0.003657

Table 7 - *Continued*

	Comparison			Market-Adjusted			Market Model		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
				Panel B: Grouped on Market Value					
				Based on Independent Method or Within-Groups Method Ranked by Market Value first					
Small	-0.032100	-0.016001	-0.017349	-0.024423	-0.008244	-0.009598	-0.012657	-0.000650	-0.001655
Medium	-0.039110	-0.025363	-0.026507	-0.022492	-0.007624	-0.008862	-0.021335	-0.006642	-0.007864
Large	-0.040737	-0.038040	-0.038264	-0.002294	0.000020	-0.000172	-0.016006	-0.010018	-0.010517
				Based on Within-Groups Method Ranked by Number of Analysts first					
Small	-0.028678	-0.011978	-0.013372	-0.021879	-0.004957	-0.006369	-0.011746	0.003667	0.002381
Medium	-0.033627	-0.026602	-0.027188	-0.017846	-0.011019	-0.011589	-0.016393	-0.008096	-0.008786
Large	-0.048848	-0.040035	-0.040768	-0.009209	0.000359	-0.000437	-0.022329	-0.012230	-0.013069

Table 8
Excess Returns Grouping Independently by Number of Analysts only or Market Value only on the Main Board

Monthly Excess Portfolio Returns are calculated by taking the difference between the realized and the expected returns. The expected returns are calculated by various methods:- the Comparison Method - compared with its own mean of the previous periods, Market-Adjusted Method - compared with contemporaneous market return, and Market Model Method - by taking the risk into consideration. Returns for January, non-January, and all months are also investigated. In Panel A, stocks are ranked by the Number of Analysts and then divided into 3 portfolios by having less than or equal to one analyst as the Low Port, more than one but less than or equal to three analysts as the Medium Port and the High Port contains more than three analysts. Stocks are ranked by Market Values of the Firms in Panel B, and then divided equally into 3 portfolios, namely Small, Medium and Large. Returns and Market Values of all stocks are from Stock Exchange of Thailand and PACAP, and Number of Analysts are from I/B/E/S from 1992 to 1996.

	Comparison			Market-Adjusted			Market Model		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
				Panel A: Rank on Number of Analyst					
Low	-0.037938	-0.038780	-0.038709	-0.036804	-0.015891	-0.017651	-0.028992	-0.012798	-0.014161
Medium	-0.042268	-0.018308	-0.020284	-0.019357	-0.001731	-0.003185	-0.016558	-0.003040	-0.004155
High	-0.031234	-0.023544	-0.024186	-0.002815	-0.001975	-0.002045	-0.008797	-0.002710	-0.003218
				Panel B: Rank on Market Value					
Small	-0.032199	-0.016101	-0.017448	-0.024423	-0.008244	-0.009598	-0.012660	-0.000619	-0.001626
Medium	-0.038755	-0.024926	-0.026077	-0.022492	-0.007624	-0.008862	-0.021286	-0.006204	-0.007459
Large	-0.039432	-0.036692	-0.036920	-0.002294	0.000020	-0.000172	-0.015753	-0.009389	-0.009918

give higher abnormal returns. None of the portfolios grouped on market value shows the January effect.

Table 8 shows the excess abnormal returns grouping independently on either the number of analyst or market values. Panel A groups the excess abnormal return by number of analyst. Information effect by the Market model is very robust where the high number of analyst shows high abnormal return. January abnormal returns by Market-adjusted model are higher in high analyst group. When ranked by market values of firms, the comparison method shows the robust small-firm effect that large firms earn lower abnormal return, the same result is also in non-January and all months by Market model. However, the result by market-adjusted model is also very robust but in the opposite way.

In general, different portfolio methods or different excess return methods give different results. However, the information effect seems to occur in many methods where the portfolios with high number of analysts offer the highest return. This result is opposite to what Merton model expects. The small-firm effect where the smaller firms offer higher abnormal return is quite strong in all methods. The January effect where the January return is higher than the return of other months is not found, on the contrary, January return seems to be the lower.

A.2 Effect On the Foreign Board

Table 9 to 12 reports the excess abnormal returns formed by various portfolio method and different methods in calculating the excess abnormal returns of the stocks on the Foreign Board. Table 9 uses the Within-groups methods having analysts following the firm as the control variable to form portfolios. In Panel A, the information effect where the high analyst give low abnormal return is quite robust, except in non-January of small firms, and January of large firms. The small firm effect is also detected in non-January of the medium and high analyst, and in all months of high analyst. Panel B shows the Market-adjusted method, in small size, the higher analyst give higher abnormal return is found in all portfolios, and also found in non-January of large size. The result of medium size is conflicting. in non-January and all months, higher analyst gives higher abnormal return where in January the direction is opposite. The size effect is found where the larger firms give higher abnormal return in January of high analyst, in non-January of medium analyst, and in all months of medium and high analysts The Market model method is reported in Panel C. The information effect where the high analyst give the lowest abnormal return is shown in non-January and all months of small firms, in January of medium firms, and in non-January, and all months of the large firms. The small firm effect where the large firms offer the lower abnormal return is found in non-January and all months of high analysts portfolios. The January effect is found in the medium size with medium and high analyst in all methods, and in large firms with high analyst by Comparison method, with low and high analyst by Market-adjusted method, and in Market model method.

Panel A in Table 10 uses the Comparison method for the Independent Portfolios to find the excess abnormal return. Controlling the market values of the firms, the information effect where the high number of analyst give low abnormal return is quite robust in all portfolios except in January of large firms. The firm size effect is mixing, in January with medium analyst, the large firms give low abnormal return but with high analyst, the high abnormal return is given instead. The Market-adjusted method is used in Panel B. The large analyst give higher abnormal return in every portfolios of small firm, and in January of the medium firms. The firm size effect is also found in non-January and all months of small analyst, and in all portfolios of large firms. The Market model method is shown in Panel C. The information effect where the high analyst gives low abnormal return is very robust in small firms, also the effect is found in January of medium firms and non-January and all months of large firms. The firm size effect is mixing. Large firms earning lower abnormal return is found only in January of medium analyst, while large firms earning higher abnormal return is found in large firms in January with high analyst, in non-January and all months with low analyst. The January effect is quite strong in all portfolios.

Table 11 shows the excess abnormal returns grouped by Within-group plus Randomization method. Panel A groups the excess abnormal return by number of analyst. Based on Independent method, comparison and Market model give the robust information effect where the high analyst portfolios give the low abnormal return, on the other hand, the Market-adjusted abnormal return give the opposite direction. Based on Within-group method having analysts as the first control variable, results are

results are the same as in the independent method. Panel B forms the portfolio by market values. Based on the independent method, the size effect where the large firms offer the higher abnormal return is found in January of Comparison method, and in all portfolios of the Market-adjusted method. Based on the within-groups ranked by number of analyst first, the small-size effect is found where the larger firms earn lower abnormal returns in non-January and all months, at the same time, the larger firms give higher abnormal returns in January and all months by Market-adjusted method. The January effect is detected in almost all of the portfolios.

Table 12 shows the excess abnormal return grouped independently by either number of analyst or market values. Panel A reports ranking on number of analyst. The Market model reports the robust result that high analyst portfolios giver higher abnormal returns, while in Market-adjusted method, the same result is detected in January. Panel B ranks on market values. Comparison method shows the robust result that the large firms earn lower abnormal returns, the same result is found in non-January, and all months of Market model On the other hand. the larger firms give higher abnormal return in the market-adjusted method. The January effect is not found in all the portfolios.

In conclusion, the result using I/B/E/S database on the Main Board tends to support the small-firm effect where the large firms earn lower abnormal return than the small firms. On the Foreign Board, the information effect where the firms with high number of analyst earn lower abnormal return is quite strong. Also, different

Table 9
Excess Returns by Various Methods for Within-Groups Method having Number of Analysts as the First Control Variable on the Foreign Board

Monthly Excess Portfolio Returns are calculated by taking the difference between the realized and the expected returns by various methods. In Panel A, the Comparison Method is employed. Market-Adjusted Method is in Panel B, and Panel C shows the Market Model Method. Portfolios are formed by the Within-Groups Method having Analysts Mean as the first control variable Stocks are first ranked by Number of Analysts Following the Firm by having less than or equal to one analyst as the Low Port, more than one but less than or equal to three analysts as the Medium Port and the High Port contains more than three analysts. Within each port, stocks are then ranked by Market Value and divided into three equal portfolios namely Small, Medium and Large. There are totally 9 portfolios. Returns for January, non-January, and all months are also investigated. Returns and Market Values of all stocks traded on the Main Board are taken from Stock Exchange of Thailand and PACAP and Number of Analysts are from I/B/E/S Database from 1992 to 1996.

Rank on Analysts Mean	Rank on Market Value								
	Small			Medium			Large		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
				Panel A: The Comparison Method					
Low	n/a	0.00366	0.00366	n/a	0.07133	0.07133	0.2632	0.05382	0.06651
Medium	-0.0444	0.00907	0.00158	0.1716	0.00671	0.01604	-0.0321	-0.01105	-0.01209
High	-0.0216	-0.01047	-0.01140	0.0281	-0.03415	-0.02889	0.0088	-0.03906	-0.03511
				Panel B: The Market-Adjusted Method					
Low	n/a	-0.22812	-0.22812	n/a	-0.33496	-0.33496	0.1645	-0.11243	-0.09564
Medium	-0.1548	-0.06084	-0.07399	0.0842	-0.04494	-0.03763	-0.0249	-0.01117	-0.01184
High	-0.0301	-0.02803	-0.02820	0.0332	-0.03286	-0.02727	0.0476	-0.00690	-0.00241
				Panel C: The Market Model Method					
Low	n/a	0.01361	0.01361	n/a	-0.11322	-0.11322	0.7966	0.34440	0.37181
Medium	-0.0657	0.01072	0.00001	0.1556	0.02941	0.03655	-0.0104	-0.00023	-0.00073
High	-0.0150	-0.00463	-0.00549	0.0334	-0.02548	-0.02051	0.0189	-0.02723	-0.02342

Table 10

Excess Returns by Various Methods for Independent Method or

Within-Groups Method having Market Value of the Firm as the First Control Variable on the Foreign Board

Monthly Excess Portfolio Returns are calculated by taking the difference between the realized and the expected returns by various methods. In Panel A, the Comparison Method is employed. Market-Adjusted Method is in Panel B, and Panel C shows the Market Model Method. Portfolios are formed by the Independent Method which results in the same way as Within-Groups Method having Market Value as the first Control Variable. For the Independent method, stocks are ranked by market value first and then divided into three equal portfolios namely Small, Medium and Large. Stocks are also ranked independently by Number of Analysts Following the Firm by having less than or equal to one analyst as the Low Port, more than one but less than or equal to Three analysts as the Medium Port and the High Port contains more than three analysts. Then, stocks that fall in small group of number of analyst and small size are grouped together and so on, resulting in 9 portfolios totally. Returns for Non-January, January, and all months are also investigated. Returns and Market Values of all stocks traded on the Foreign Board are taken from Stock Exchange of Thailand and PACAP, and Number of analysts are from I/B/E/S database from 1992 to 1996.

Rank on Number of Analyst	Rank on Market Value								
	Small			Medium			Large		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
				Panel A: The Comparison Method					
Low	n/a	0.00015	0.00015	n/a	0.17608	0.17608	0.2094	-0.00362	0.01413
Medium	0.0546	-0.03271	-0.02445	0.0388	0.03950	0.03946	-0.0427	-0.02684	-0.02758
High	-0.0149	-0.06216	-0.05737	0.0016	-0.01418	-0.01288	0.0160	-0.03482	-0.03062
				Panel B: The Market-Adjusted Method					
Small	n/a	-0.26949	-0.26949	n/a	-0.12957	-0.12957	0.1645	-0.11495	-0.09166
Medium	-0.0183	-0.12226	-0.11243	-0.0517	0.00063	-0.00281	-0.0348	-0.00773	-0.00900
Large	-0.0134	-0.09147	-0.08356	0.0041	-0.09147	-0.02076	0.0397	-0.01407	-0.00963
				Panel C: The Market Model Method					
Small	n/a	0.00051	0.00051	n/a	0.03582	0.03582	0.9031	0.48979	0.52423
Medium	0.0590	-0.03183	-0.02323	0.0320	0.06431	0.06219	-0.0082	-0.01735	-0.01692
Large	-0.0042	-0.05873	-0.05321	0.0072	-0.00916	-0.00782	0.0256	-0.02322	-0.01918

Table 11
Excess Returns by Various Method
for Within-Groups Plus Randomization Method on the Foreign Board

Monthly Excess Portfolio Returns are calculated by taking the difference between the realized and the expected returns. The expected returns are calculated by various methods:- the Comparison Method - compared with its own mean of the previous periods, Market-Adjusted Method - compared with contemporaneous market return, and Market Model Method - by taking the risk into consideration. Returns for January, non-January, and all months are also investigated. In Panel A, Portfolios are grouped across different sizes but under the same portfolios of low, medium and high number of analysts from Independent Method or Within-Groups Methods ranked by Market Value first, and from Within-Groups Method ranked by number of analysts first. In Panel B, Portfolios are grouped across different number of analysts but under the same groups of size also from Independent Method or Within-Groups Method ranked by Market Value first, and from Within-Groups Method ranked by Number of Analysts first. Data are from 1992 to 1996 on the Foreign Board.

	Comparison			Market-Adjusted			Market Model		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
Panel A: Grouped by Number of Analyst									
Based on Independent Method or Within-Groups Method Ranked by Market Value first									
Low	0.2094	0.03659	0.04379	0.1645	-0.16516	-0.15142	0.9031	0.24219	0.26973
Medium	0.0216	-0.00129	0.00019	-0.0365	-0.02856	-0.02907	0.0297	0.01256	0.01367
High	0.0114	-0.03149	-0.02792	0.0294	-0.01915	-0.01511	0.0202	-0.02164	-0.01816
Based on Within-Groups Method Ranked by Number of Analysts first									
Low	0.2632	0.04733	0.05597	0.1645	-0.17121	-0.15778	0.7966	0.20610	0.22973
Medium	0.0195	-0.00272	-0.00128	-0.0365	-0.02856	-0.02907	0.0173	0.01060	0.01104
High	0.0101	-0.03255	-0.02900	0.0294	-0.01915	-0.01511	0.0181	-0.02280	-0.01939

Table 11 -*Continued*

	Comparison			Market-Adjusted			Market Model		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
Panel B: Grouped on Market Value									
Based on Independent Method or Within-Groups Method Ranked by Market Value first									
Small	0.00624	-0.04940	-0.04420	-0.1490	-0.11189	-0.10283	0.01503	-0.04693	-0.04114
Medium	0.00603	-0.00429	-0.00347	-0.00251	-0.02078	-0.01934	0.01015	0.00195	0.00260
Large	0.01619	-0.03422	-0.03013	0.03885	-0.01460	-0.01027	0.03207	-0.01883	-0.01470
Based on Within-Groups Method Ranked by Number of Analysts first									
Small	-0.02424	-0.008967	-0.010288	-0.04440	-0.033015	-0.034001	-0.02079	-0.003351	-0.004860
Medium	0.03575	-0.030262	-0.024857	0.03593	-0.035719	-0.029852	0.03991	-0.021706	-0.016660
Large	0.00963	-0.035040	-0.031502	0.04504	-0.008981	-0.004703	0.02673	-0.018824	-0.015216

Table 12
Excess Returns Grouping Independently by Number of Analysts only or Market Value only on the Foreign Board

Monthly Excess Portfolio Returns are calculated by taking the difference between the realized and the expected returns. The expected returns are calculated by various methods:- the Comparison Method - compared with its own mean of the previous periods, Market-Adjusted Method - compared with contemporaneous market return, and Market Model Method - by taking the risk into consideration. Returns for January, non-January, and all months are also investigated. In Panel A, stocks are ranked by the Number of Analysts and then divided into 3 portfolios by having less than or equal to one analyst as the Low Port, more than one but less than or equal to three analysts as the Medium Port and the High Port contains more than three analysts. Stocks are ranked by Market Values of the Firms in Panel B, and then divided equally into 3 portfolios, namely Small, Medium and Large. Returns and Market Values of all stocks are from Stock Exchange of Thailand and PACAP, and Number of Analysts are from I/B/E/S from 1992 to 1996.

	Comparison			Market-Adjusted			Market Model		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
				Panel A: Rank on Number of Analyst					
Low	-0.037938	-0.038780	-0.038709	-0.036804	-0.015891	-0.017651	-0.028992	-0.012798	-0.014161
Medium	-0.042268	-0.018308	-0.020284	-0.019357	-0.001731	-0.003185	-0.016558	-0.003040	-0.004155
High	-0.031234	-0.023544	-0.024186	-0.002815	-0.001975	-0.002045	-0.008797	-0.002710	-0.003218
				Panel B: Rank on Market Value					
Small	-0.032199	-0.016101	-0.017448	-0.024423	-0.008244	-0.009598	-0.012660	-0.000619	-0.001626
Medium	-0.038755	-0.024926	-0.026077	-0.022492	-0.007624	-0.008862	-0.021286	-0.006204	-0.007459
Large	-0.039432	-0.036692	-0.036920	-0.002294	0.000020	-0.000172	-0.015753	-0.009389	-0.009918

portfolio formation methods and different methods to calculate the excess returns give different results; therefore, the information effect or size effect are inconclusive.

B. THE TESTS ON THE CAPITAL ASSET PRICING MODEL

Based on the study of Merton (1987), the Capital Asset Pricing Model does not hold. Not only the systematic risk affects the expected return, but also the firm-specific risk, the portion of market portfolio invested in security k, and the portion of investors who know about security k. Also the study by Fama and French (1992) states that size and book-to-market value of equity affects the expected return while the systematic risk does not. Table 13 tests the Capital Asset Pricing Model where the incomplete information model of Merton (1987), and Fama and French (1992) model are combined. Number of analysts are taken from I/B/E/S Database. Panel A shows the regression without size-orthogonalization. and data on investor base with size-orthogonalization are used in Panel B. From Merton's Model, the result shows that both systematic risk and non-systematic risk have the effect on the excess return where the positive relationship of both variables are significant at 1 percent and 10 percent respectively. This is consistent with the study by Friend, Westerfield, and Granito (1978) that the expected returns seem to depend on both market risk and total variance. Using Fama and French (1992) model, the excess return is positively related to the non-systematic risk at 1 percent significance level, and to the debt ratio at 10 percent significance level and negatively related to price to book value of equity at 5 percent significance level. With higher risk, the expected return should be

higher. With more debt, the default risk should be higher, the higher return should be expected to compensate for that risk. This is consistent with Bhandari (1988). Share price should reflect the book value of equity; therefore, the higher the price to book value of equity, the better the firm's performance in the eyes of investors resulting in lower expected return. The negative result between excess return and price-to-book value of equity is consistent with Fama and French (1992), Stattman (1980), Rosenberg, Reid, and Lanstein (1985), and Chan, Hamao, and Lakonishok (1991).

Because of very high correlation (75%) between the firm size and the number of analysts as shown in Table 4, and by following Chung, McInish, Wood and Wyhowski (1995), the number of analyst is made orthogonal to firm size by regressing number of analyst against firms size and the residual of the regression model is calculated and brought to replace the size variable in the models. The result when number of analyst is made orthogonalized to firm size is shown in Panel B. When size effect is separated from the information effect, only the systematic risk and size have the effect on the return where the positive relationship between beta and return and negative relationship between size and return are detected. For the firm size, the result is consistent with the previous studies (Banz (1981), Reinganum (1981), and others) who find that the small firm gives higher return than the larger one. The results of Fama and French in Panel B is very similar to Panel A because in Fama and French Model, both size and investor base variables are not significant.

Table 13

Regression of Annual Excess Return based on Merton's Model (1987) and Fama&French's Model (1992) on the Main Board

Merton Model uses the Regression of the Annual Return over the Risk-free Rate, R_k-R_f, on the Systematic Risk, β_k, the Residual Risk, σ^2_k, Natural Log of Market Value of the Common Stock, $Ln(SZ_k)$, and the Investor Base, IB_k.

$$R_k - R_f = \theta_0 + \theta_1\beta_k + \theta_2\sigma^2_k + \theta_3 Ln(SZ_k) + \theta_4 \text{ Investor Base }_k + e_k,$$

Fama & French (1992) regress the Annual Return over Risk-Free rate, R_k-R_f, on the Systematic Risk, β_k, the Residual Risk, σ^2_k, Natural Log of Market Value of the Common Stock, $Ln(SZ_k)$, Natural Log of Price to Book Value of Equity, $Ln(PB_k)$, Price-Earnings Ratio, $Ln(PE_k)$, and Debt Ratio (Long-term Liability over Total Asset). The variable of Investor Base is added into this model

$$R_k - R_f = \theta_0 + \theta_1\beta_k + \theta_2\sigma^2_k + \theta_3 Ln(SZ_k) + \theta_4 \text{ Investor Base }_k + \theta_5 Ln(PB_k) + \theta_6 (PE_k) + \theta_7 \text{ Debt ratio} + e_k,$$

Investor base is proxied by number of analysts following the firm from I/B/E/S database from 1992 to 1996. Finance, Banking and Insurance Sectors are excluded from Fama and French 's Model.

Panel A shows the regression without size-orthogonalization. Size is orthogonalized by regressing size on the investor base and take the residual value to replace $Ln(SZ_k)$ in Merton's and Fama and French's Model. The size-orthogonalized result is shown in Panel B.

Table 13 - *Continued*

	Coefficients of Variables						
	Beta	Sigma	Size	Investor Base	Price-to Book Value	Price-Earnings	Debt Ratio
	Panel A: Without Orthogonalized						
Merton Model	0.015751*** (0.002)	0.250316* (0.0882)	-0.000536 (0.8274)	0.014320 (0.2324)			
Fama & French Model	-0.000962 (0.8852)	0.7266*** (0.0078)	-0.000422 (0.9012)	0.021849 (0.1554)	-0.12743** (0.0197)	$0.4902*10^{-4}$ (0.2063)	0.039109* (0.0678)
	Panel B: With Orthogonalized						
Merton Model	0.0155*** (0.0001)	0.191073 (0.1798)	-0.0262*** (0.0001)	0.010749 (0.1919)			
Fama & French Model	-0.001293 (0.8413)	0.7174*** (0.0064)	-0.13718 (0.1350)	0.016088 (0.2128)	-0.010025* (0.0588)	$0.5377*10^{-4}$ (0.1650)	0.036420* (0.0779)

* Significant at 10 percent level.
** Significant at 5 percent level.
*** Significant at 1 percent level.

Table 14 shows the result of the effect of various variables on the excess return of stocks traded on the Foreign Board. In Merton Model of Panel A, only one variable that is evidenced to have the effect on the excess return is size and it is positively significant at 10 percent level. This is consistent with Merton (1987). However, the price-earnings ratio in Fama and French Model turns to be significantly positive at 1 percent level. This is against the previous studies where the lower the price earnings ratio reflects the higher risk of the firm and then the higher return should be required by the investor. When the number of analysts is made orthogonal to the size in Panel B, the results in Fama and French Model are not different between the two tables. However, in Merton model, the size turns to be insignificant. The results reported which are not as expected may be due to the illiquidity of the stocks traded in the Foreign Board and samples are very small with only 39 stocks from 1992 to 1996, or there is no size or information effect on the abnormal return on the Foreign Board.

In conclusion, different models give different result. However, with most of all the models used, it is shown that at least one variable other than the systematic risk has the effect on the excess return. Thus, applying the Capital Asset Pricing Model to Thai data should be done with care. However, for the investor base or the information effect, all the models show that there is no significant relationship between the investor base and the abnormal return.

Table 14

Regression of Annual Excess Return based on Merton's Model (1987) and Fama&French's Model (1992) on the Foreign Board

Merton Model uses the Regression of the Annual Return over the Risk-free Rate, R_k-R_f, on the Systematic Risk, β_k, the Residual Risk, σ_k, Natural Log of Market Value of the Common Stock, $Ln(SZ_k)$, and the Investor Base, IB_k.

$$R_k - R_f = \theta_0 + \theta_1\beta_k + \theta_2\sigma_k + \theta_3 Ln(SZ_k) + \theta_4 \text{ Investor Base}_k + e_k,$$

Fama & French (1992) regress the Annual Return over Risk-Free rate, R_k-R_f, on the Systematic Risk, β_k, the Residual Risk, σ_k, Natural Log of Market Value of the Common Stock, $Ln(SZ_k)$, Natural Log of Price to Book Value of Equity, $Ln(PB_k)$, Price-Earnings Ratio, $Ln(PE_k)$, and Debt Ratio (Long-term Liability over Total Asset). The variable of Investor Base is added into this model

$$R_k - R_f = \theta_0 + \theta_1\beta_k + \theta_2\sigma_k + \theta_3 Ln(SZ_k) + \theta_4 \text{ Investor Base}_k + \theta_5 Ln(PB_k) + \theta_6 (PE_k) + \theta_7 \text{ Debt ratio} + e_k,$$

Investor base is proxied by number of analysts following the firm from I/B/E/S database from 1992 to 1996. Finance, Banking and Insurance Sectors are excluded from Fama and French 's Model.

Panel A shows the regression without size-orthogonalization. Size is orthogonalized by regressing size on the investor base and take the residual value to replace $Ln(SZ_k)$ in Merton's and Fama and French's Model. The size-orthogonalized result is shown in Panel B.

Table 14 - *Continued*

	Coefficients of Variables						
	Beta	Sigma	Size	Investor Base	Price-to Book Value	Price-Earnings	Debt Ratio
			Panel A: Without Orthogonalized				
Merton Model	$-0.6176*10^{-5}$ (0.9986)	0.030801 (0.2030)	0.007554* (0.0786)	-0.015220 (0.5401)			
Fama & French Model	0.002442 (0.6932)	-0.00492 (0.9194)	0.000485 (0.9529)	0.019412 (0.6631)	-0.003449 (0.7871)	0.00016*** (0.0071)	0.013411 (0.7770)
			Panel B: With Orthogonalized				
Merton Model	0.007770 (0.1673)	0.018740 (0.6284)	-0.050478 (0.4008)	0.013479 (0.4621)			
Fama & French Model	0.007105 (0.3088)	-0.000812 (0.9868)	-0.044737 (0.5723)	0.021562 (0.6047)	-0.007532 (0.5686)	0.00015*** (0.0066)	0.015914 (0.7304)

* Significant at 10 percent level.
** Significant at 5 percent level.
*** Significant at 1 percent level.

B. The Factors affecting Cost of Incomplete Information

As in the incomplete information model of Merton (1987), the Capital Asset Pricing Model does not hold, and it incurs additional return that cannot be completely explained by the systematic risk, and this happens because the information is not complete in the market. Only investors who know the information on security k will trade in the market, and to obtain those information, it incurs some costs. Merton (1987) determines the factors that have the effect on the cost of incomplete information are the firm-specific risk, the portion of market portfolios invested in security k, and the portion of investors invested in security k. Table 15 shows the results of the factors that have the effect on the cost of incomplete information on the Main Board. I/B/E/S Database is used for the number of analysts. In panel A, only firm's specific risk is found to be positively related to the cost of incomplete information at 10 percent significant level. This is consistent with the previous study done by Friend, Westerfield, and Granito (1978) that the expected returns depend on market risk as well as total variance. However, when analyst is made orthogonal to the firm size in panel B, the result is changed. The information effect turns to be significantly positive at 1 percent confidence level, while Merton finds the negative relationship.

The result on the Foreign Board is shown in Table 16 where Panel A uses the data on number of analysts that are not orthogonal by firm size, and the orthogonalized one is used in Panel B. There is no significant relationship between cost of incomplete information and firm-specific risk, size, and investor base. As

Table 15

Factors affecting the Cost of Incomplete Information on the Main Board

The Regression of the Annual Cost of Incomplete Information, λ_k, on the Systematic Risk, β_k, the Residual Risk, σ^2_k, the Market Value of the Common Stock, SZ_k, and the Investor Base, IB_k. Investor Base is proxied by the Number of Analysts following the firm from 1992 to 1996 from I/B/E/S Database.

$$\lambda_k = \eta_0 + \eta_1 \sigma^2_k + \eta_2 \text{Ln}(\text{Size}_k) + \eta_3 \text{ Investor Base}_k + \varepsilon_k$$

Regression Variables

σ^2_k	Size_k	Investor Base_k
	Without Orthogonalizing	
0.267427* (0.0696)	0.008036 (0.4977)	0.002410 (0.3006)
	With Orthogonalizing	
0.222305 (0.1230)	-0.049307 (0.1466)	0.022424*** (0.0071)

* Significant at 10 percent level
** Significant at 5 percent level
*** Significant at 1 percent level

Table 16

Factors affecting the Cost of Incomplete Information on the Foreign Board

The Regression of the Annual Cost of Incomplete Information, λ_k, on the Systematic Risk, β_k, the Residual Risk, σ_k, the Market Value of the Common Stock, SZ_k, and the Investor Base, IB_k. Investor Base is proxied by the Number of Analysts following the firm from 1992 to 1996 from I/B/E/S Database.

$$\lambda_k = \eta_0 + \eta_1 \sigma^2_k + \eta_2 \text{Ln}(\text{Size}_k) + \eta_3 \text{Investor Base}_k + \varepsilon_k$$

Regression Variables

σ^2_k	Size_k	Investor Base_k
	Without Orthogonalizing	
0.064317 (0.3683)	0.005253 (0.5691)	0.053240 (0.3223)
	With Orthogonalizing	
0.034166 (0.3524)	-0.53982 (0.3663)	0.022567 (0.1852)

* Significant at 10 percent level
** Significant at 5 percent level
*** Significant at 1 percent level

expected, there should be no incomplete information on the Foreign Board. All of the foreign investors who traded on the Foreign Board are supposed to know information very well about the security or q_{ik} in Merton's model is equal to one, and this will eliminate the costs of incomplete information.

In conclusion, the I/B/E/S database which contains more foreign brokers may be suitable for the Foreign Board where the foreign investors may learn the information from their brokerage house. Both on the Main and Foreign Board, no information effect is detected.

III. ROBUSTNESS CHECK

A. Firm size effect and Information effect

Because of the nature of the data on I/B/E/S which are mainly the foreign brokers, data on MIS which are from 15 local brokers/sub-brokers who recommend stocks to buy are run to check for the robustness.

Table 17 to 20 show the results using MIS Database as the proxy for the number of analysts following the firm. Table 17 shows the excess abnormal returns of the portfolios formed by Within-groups method having number of analyst as the first control variable. Panel A uses the Comparison method to calculate the excess abnormal return. The information effect where the high number of analyst give lower

abnormal return is found in non-January and all months of medium size, where January of large size found the opposite. The small-firm effect where the large firms give lower abnormal return is found in January of low analyst, in non-January of medium analyst. On the other hand, the opposite result is found in all months of high analyst. In Panel B, the result that high number of analyst gives lower abnormal return is also found in the Market-adjusted method in non-January and all months of large firms, while in non-January of medium and large firms and all months of medium firms, the results turns to be opposite. In Panel C, the information effect in Market model where high analyst portfolios give low abnormal returns is found in non-January and all months of large firms, on the contrary, non-January abnormal returns of small firms, and January abnormal returns of large firms give the opposite result. The small-firm effect where the large firms give the small abnormal return is found in high analyst group. The January effect is quite robust in the Comparison method. In the Market-adjusted method, the effect is found in small firms with low and medium analyst, in medium firms with low analyst, and in large firms with medium and high analysts.

Excess abnormal returns grouped by independent method* are shown in Table 18. Controlling the market values of the firms, the information effect where high number of analysts of the medium and large size gives lower abnormal return is found in non-January, and all months. On the contrary, in January with the large size, the results show that high analyst portfolios give high abnormal return. The information effect where the large number of analyst give lower abnormal returns is shown in

January and non-January of medium size, and non-January of large size is detected. However, in the small size, non-January and all months abnormal return show the opposite result. For the Market model method, the information effect where the high analyst give low abnormal return is found in all months of medium size, and non-January, and all months of large size. The January effect is found by the Comparison method in small firms with all rankings on analyst, in medium firms of low and medium analyst, and in large firms of medium and high analyst. In the Market-adjusted method, the January effect is found in small and medium firms with low analyst, and in large firms in high number of analyst. The January effect by the Market model is found in small firms with small analyst, in medium firms with large analyst, and in large firms with low and high number of analysts.

Table 19 reports the excess abnormal return grouped by Within-group plus randomization method. Panel A groups the excess abnormal return by number of analyst. Based on independent method or Within-groups methods having market value as the first control variable, abnormal returns in non-January and all months of market adjusted method are increased with higher analyst group, while in Market model, non-January and all-month abnormal returns are decreased. Based on Within groups method having number of analysts as the first control variable, the information effect where the high number of analysts offer the lower abnormal return is found in non-January of Comparison method and in all months of Market model. However, the higher number of analyst gives the higher abnormal return is found in non-January and all months of Market-adjusted method, and in January of Market model. The January

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* The result based on independent method is exactly the same as the within-groups method using

effect is quite robust in all portfolios except the portfolios with medium number of analysts of the Market-adjusted and Market model. Panel B groups the excess abnormal return based on market values of the firm, the small-firm effect where the large firms give lower abnormal return is very robust in Comparison method, however, in Market-adjusted method the result is also robust but in the opposite direction. Based on Within-groups ranked by number of analysts first , the small firm effect is found in non-January and all months by Market Model. The January effect is consistently shown in every portfolios by the Comparison method, and in small size of market–adjusted method.

Table 20 groups the excess abnormal return independently either by number of analysts or by market values. Panel A ranks on number of analyst. The information effect where high analyst give low abnormal return is found in non-January of Comparison method, and in Market model. On the other hand, in non-January and all months of market-adjusted method, abnormal returns of high analyst give high abnormal returns. Panel B ranks on market value. The small-firm effect where the large firm gives lower abnormal return is very robust for the Comparison method. However, the result by Market-adjusted method is also robust but in the opposite direction. The January effect is very robust in Comparison method, while in Market-adjusted method, the effect is shown in low analyst and small size portfolios, and in Market model, low and high number of analyst shows the result.

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market value as the first control variable. Therefore, only independent method will be reported.

Table 17
Excess Returns by Various Methods for Within-Groups Method having Number of Analysts as the First Control Variable on the Main Board (MIS Database)

Monthly Excess Portfolio Returns are calculated by taking the difference between the realized and the expected returns by various methods. In Panel A, the Comparison Method is employed. Market-Adjusted Method is in Panel B, and Panel C shows the Market Model Method. Portfolios are formed by the Within-Groups Method having Analysts Mean as the first control variable Stocks are first ranked by Number of Analysts Following the Firm by having less than or equal to one analyst as the Low Port, more than one but less than or equal to three analysts as the Medium Port and the High Port contains more than three analysts. Within each port, stocks are then ranked by Market Value and divided into three equal portfolios namely Small, Medium and Large. There are totally 9 portfolios. Returns for January, non-January, and all months are also investigated. Returns and Market Values of all stocks traded on the Main Board are taken from Stock Exchange of Thailand and PACAP and Number of Analysts are from MIS Database from 1992 to 1996.

Rank on Analysts Mean	Rank on Market Value								
	Small			Medium			Large		
	January	Non-January	Ali Months	January	Non-January	All Months	January	Non-January	All Months
				Panel A: The Comparison Method					
Low	-0.01939	-0.03206	-0.03102	-0.02995	-0.05839	-0.05597	-0.05118	-0.04239	-0.04313
Medium	-0.02911	-0.05479	-0.05265	-0.06019	-0.06251	-0.06231	-0.03407	-0.06259	-0.06021
High	0.03084	-0.02263	-0.01818	-0.02456	-0.09470	-0.08885	0.00669	-0.05801	-0.05262
				Panel B: The Market-Adjusted Method					
Low	-0.01154	-0.01474	-0.01447	-0.00901	-0.02961	-0.02786	-0.01341	0.00247	0.00114
Medium	-0.01648	-0.01771	-0.01761	-0.02984	-0.01006	-0.01171	0.00064	-0.00578	-0.00524
High	-0.00922	0.00894	0.00742	0.01667	-0.00497	-0.00317	0.00441	-0.01179	-0.01044
				Panel C: The Market Model Method					
Low	0.00536	-0.00217	-0.00155	0.00792	-0.01853	-0.01628	-0.03196	-0.00207	-0.00456
Medium	-0.04463	-0.01207	-0.01479	-0.07235	-0.00682	-0.01228	-0.02829	-0.02329	-0.02371
High	-0.01654	0.02167	0.01849	-0.00207	-0.02292	-0.02118	-0.00440	-0.04878	-0.04509

Table 18
Excess Returns by Various Methods for Independent Method or Within-Groups Method having Market Value of the Firm as the First Control Variable on the Main Board (MIS Database)

Monthly Excess Portfolio Returns are calculated by taking the difference between the realized and the expected returns by various methods. In Panel A, the Comparison Method is employed. Market-Adjusted Method is in Panel B, and Panel C shows the Market Model Method. Portfolios are formed by the Independent Method which results in the same way as Within-Groups Method having Market Value as the first Control Variable. For the Independent method, stocks are ranked by market value first and then divided into three equal portfolios namely Small, Medium and Large. Stocks are also ranked independently by Number of Analysts Following the Firm by having less than or equal to one analyst as the Low Port, more than one but less than or equal to Three analysts as the Medium Port and the High Port contains more than three analysts. Then, stocks that fall in small group of number of analyst and small size are grouped together and so on, resulting in 9 portfolios totally. Returns for Non-January, January, and all months are also investigated. Returns and Market Values of all stocks traded on the Main Board are taken from Stock Exchange of Thailand and PACAP, and Number of analysts are from MIS database from 1992 to 1996.

Rank on Number of Analyst	Rank on Market Value								
	Small			Medium			Large		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
Panel A: The Comparison Method									
Low	-0.03044	-0.04582	-0.04453	-0.03236	-0.04488	-0.04383	-0.06336	-0.03919	-0.04121
Medium	-0.03062	-0.05881	-0.05645	-0.03315	-0.06077	-0.05846	-0.05219	-0.06037	-0.05969
High	0.12963	0.04277	0.05001	-0.11388	-0.06168	-0.06603	0.00727	-0.08030	-0.07300
Panel B: The Market-Adjusted Method									
Small	-0.02356	-0.02467	-0.02458	0.00278	-0.00441	-0.00381	0.00659	0.01156	0.01115
Medium	-0.02366	-0.02238	-0.02249	-0.01793	-0.01149	-0.01202	-0.00944	-0.00586	-0.00616
Large	0.06691	0.03934	0.04164	-0.02831	-0.02474	-0.02504	0.00103	-0.00566	-0.00511
Panel C: The Market Model Method									
Small	-0.00913	-0.01147	-0.01128	-0.00414	-0.00247	-0.00261	0.00468	-0.00848	-0.00738
Medium	-0.05075	-0.02141	-0.02386	-0.06213	-0.00139	-0.00646	-0.03722	-0.02047	-0.02186
Large	0.07228	0.07020	0.07038	0.00555	-0.02047	-0.01830	0.00578	-0.03985	-0.03605

Table 19
Excess Returns by Various Method
for Within-Groups Plus Randomization Method on the Main Board (MIS Database)

Monthly Excess Portfolio Returns are calculated by taking the difference between the realized and the expected returns. The expected returns are calculated by various methods:- the Comparison Method - compared with its own mean of the previous periods, Market-Adjusted Method - compared with contemporaneous market return, and Market Model Method - by taking the risk into consideration. Returns for January, non-January, and all months are also investigated. In Panel A, Portfolios are grouped across different sizes but under the same portfolios of low, medium and high number of analysts from Independent Method or Within-Groups Methods ranked by Market Value first, and from Within-Groups Method ranked by number of analysts first. In Panel B, Portfolios are grouped across different number of analysts but under the same groups of size also from Independent Method or Within-Groups Method ranked by Market Value first, and from Within-Groups Method ranked by Number of Analysts first. Data are from 1992 to 1996 on the Main Board.

	Comparison			Market-Adjusted			Market Model		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
				Panel A: Grouped by Number of Analyst					
				Based on Independent Method or Within-Groups Method Ranked by Market Value first					
Low	-0.03394	-0.044907	-0.043989	-0.01128	-0.014078	-0.013845	-0.00612	-0.007881	-0.007734
Medium	-0.04136	-0.060181	-0.058612	-0.01522	-0.011142	-0.011482	-0.04835	-0.014264	-0.017107
High	0.00216	-0.0161011	-0.0055747	0.00452	-0.003111	-0.002475	0.01442	-0.022125	-0.019080
Low	-0.03356	-0.044441	-0.043531	-0.01128	-0.014078	-0.013845	-0.00610	-0.007700	-0.007566
Medium	-0.04118	-0.059995	-0.058426	-0.01522	-0.011142	-0.011482	-0.04844	-0.014074	-0.016940
High	0.00317	-0.060004	-0.054740	0.00452	-0.003111	-0.002475	-0.00729	-0.018345	-0.017423

Table 19 -*Continued*

	Comparison			Market-Adjusted			Market Model		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
Panel B: Grouped on Market Value									
Based on Independent Method or Within-Groups Method Ranked by Market Value first									
Small	-0.02629	-0.048039	-0.046217	-0.02122	-0.022171	-0.022091	-0.02159	-0.012803	-0.013540
Medium	-0.03559	-0.054278	-0.052720	-0.00979	-0.009034	-0.009097	-0.03603	-0.002488	-0.005283
Large	-0.04505	-0.061110	-0.059772	-0.00648	-0.004183	-0.004375	-0.02731	-0.022004	-0.022446
Based on Within-Groups Method Ranked by Number of Analysts first									
Small	-0.02178	-0.044286	-0.042415	-0.01419	-0.014949	-0.014886	-0.02431	-0.006277	-0.00777
Medium	-0.04624	-0.063158	-0.061737	-0.01874	-0.017064	-0.017205	-0.03698	-0.012324	-0.014394
Large	-0.03760	-0.054788	-0.053356	-0.00431	-0.003137	-0.003234	-0.02800	-0.017186	-0.018087

Table 20
Excess Returns Grouping Independently by Number of Analysts only or Market Value only on the Main Board (MIS Database)

Monthly Excess Portfolio Returns are calculated by taking the difference between the realized and the expected returns. The expected returns are calculated by various methods:- the Comparison Method - compared with its own mean of the previous periods, Market-Adjusted Method - compared with contemporaneous market return, and Market Model Method - by taking the risk into consideration. Returns for January, non-January, and all months are also investigated. In Panel A, stocks are ranked by the Number of Analysts and then divided into 3 portfolios by having less than or equal to one analyst as the Low Port, more than one but less than or equal to three analysts as the Medium Port and the High Port contains more than three analysts. Stocks are ranked by Market Values of the Firms in Panel B, and then divided equally into 3 portfolios, namely Small, Medium and Large. Returns and Market Values of all stocks are from Stock Exchange of Thailand and PACAP, and Number of Analysts are from I/B/E/S from 1992 to 1996.

	Comparison			Market-Adjusted			Market Model		
	January	Non-January	All Months	January	Non-January	All Months	January	Non-January	All Months
				Panel A: Rank on Number of Analyst					
Low	-0.03395	-0.044877	-0.043963	-0.01128	-0.014078	-0.013845	-0.00580	-0.007979	-0.007797
Medium	-0.04131	-0.060104	-0.058536	-0.01522	-0.011142	-0.011482	-0.04904	-0.014185	-0.017093
High	0.00304	-0.060132	-0.054868	0.00452	-0.003111	-0.002475	0.01358	-0.017390	-0.014809
				Panel B: Rank on Market Value					
Small	-0.02666	-0.048406	-0.046583	-0.02122	-0.022171	-0.022091	-0.02157	-0.012746	-0.013486
Medium	-0.03551	-0.054198	-0.052640	-0.00979	-0.009034	-0.009097	-0.03653	-0.002289	-0.005142
Large	-0.04422	-0.060282	-0.058944	-0.00648	-0.004183	-0.004375	-0.03055	-0.020544	-0.021378

Again, the result is inconclusive, with different methods of portfolio formation or excess return methods, the results are not the same. The January effect is quite strong. However, the effect occurs in both analysts and information groups; therefore, it cannot be concluded that the January effect is due to the size effect or the information effect.

B. The test on Capital Asset Pricing Model

In Panel A of Table 21, the excess return of both Merton and Fama and French Model is positively related to the investor base at 5 percent significance level and 1 percent significance level, respectively. Merton (1987) states that only investors who know about the information of security k will trade on that security; therefore, with the higher number of investors traded in the market, more information should be exposed to the public and the benefit of the information should be exploited. As a result, the abnormal return should be lower with the higher number of investors. The result shown in Panel B where the orthogonalization on size is made confirms the result of the positive relationship. This may be because price does not reflect immediately the information the investor brings in and the sample period used is quite short from 1994 to 1996. The result shows the significant negative relationship between the excess return and price to book value of equity both in Panel A and B. This is consistent with Fama and French (1992), Stattman (1980), Rosenberg, Reid, and Lanstein (1985), and Chan, Hamao, and Lakonishok (1991). However, the negative relationship between beta and return is opposite to what is expected. This may be due to the small number of data of 3 years only and only stocks that have available data on all three years are

Table 21

Regression of Annual Excess Return based on Merton's Model (1987) and Fama&French's Model (1992) on the Main Board

Merton Model uses the Regression of the Annual Return over the Risk-free Rate, R_k-R_f, on the Systematic Risk, β_k, the Residual Risk, σ^2_k, Natural Log of Market Value of the Common Stock, $Ln(SZ_k)$, and the Investor Base, IB_k.

$$R_k - R_f = \theta_0 + \theta_1\beta_k + \theta_2\sigma^2_k + \theta_3 Ln(SZ_k) + \theta_4 \text{ Investor Base}_k + e_k,$$

Fama & French (1992) regress the Annual Return over Risk-Free rate, R_k-R_f, on the Systematic Risk, β_k, the Residual Risk, σ^2_k, Natural Log of Market Value of the Common Stock, $Ln(SZ_k)$, Natural Log of Price to Book Value of Equity, $Ln(PB_k)$, Price-Earnings Ratio, $Ln(PE_k)$, and Debt Ratio (Long-term Liability over Total Asset). The variable of Investor Base is added into this model

$$R_k - R_f = \theta_0 + \theta_1\beta_k + \theta_2\sigma^2_k + \theta_3 Ln(SZ_k) + \theta_4 \text{ Investor Base}_k + \theta_5 Ln(PB_k) + \theta_6 (PE_k) + \theta_7 \text{ Debt ratio} + e_k,$$

Investor base is proxied by number of analysts following the firm from MIS database from 1994 to 1996. Finance, Banking and Insurance Sectors are excluded from Fama and French 's Model.

Panel A shows the regression without size-orthogonalization. Size is orthogonalized by regressing size on the investor base and take the residual value to replace $Ln(SZ_k)$ in Merton's and Fama and French's Model. The size-orthogonalized result is shown in Panel B.

Table 21 - *Continued*

	Coefficients of Variables						
	Beta	Sigma	Size	Investor Base	Price-to Book Value	Price-Earnings	Debt Ratio
			Panel A: Without Orthogonalized				
Merton Model	0.002560 (0.6014)	0.066935 (0.6792)	-0.001130 (0.6037)	0.04896** (0.0301)			
Fama & French Model	-0.01699** (0.0172)	0.443838 (0.1089)	0.002438 (0.4256)	0.0788*** (0.0046)	-0.01555*** (0.0030)	$0.6838*10^{-4}$ (0.1282)	0.004183 (0.8397)
			Panel B: With Orthogonalized				
Merton Model	0.001028 (0.8261)	-0.018609 (0.9039)	-0.0472*** (0.0001)	0.040** (0.0427)			
Fama & French Model	-0.0165** (0.0184)	0.379483 (0.1580)	-0.007560 (0.3662)	0.0921*** (0.0011)	-0.011396** (0.0145)	$0.6624*10^{-4}$ (0.1414)	0.005827 (0.7713)

* Significant at 10 percent level.
** Significant at 5 percent level.
*** Significant at 1 percent level.

used. For Merton Model in Panel B, size turns to be negatively significant at 1 percent level which is consistent with Banz (1981), Reinganum (1981), and others. In general, the information effect is found positively related to the return However, we have to bear in mind that MIS data are the recommend-to-buy stocks. This may imply that analysts recommend to their customers to buy the good-performed stocks.

C. Factors affecting cost of incomplete information

Data from MIS shows that size and investor base have the effect on the costs of incomplete information; however, the signs are opposite to what expected from Merton's model.

In Panel A of Table 22 where there is no size-orthogonalization, the positive relationship between the firm-specific risk and the costs of incomplete information at 10 percent significant level is reported. However, when the size variable is orthogonalized in Panel B, the firm-specific risk turns to be insignificant. Size is negatively related to the cost of incomplete information while the investor base is positively related at 1 percent significance level. The results are again contrary to what is expected from the model but it is consistent with the previous results.

In conclusion, MIS database gives the same conclusion as using I/B/E/S database for the factor that affect the cost of incomplete information that investor base is positively related to the cost of incomplete information.

Table 22

Factors affecting the Cost of Incomplete Information on the Main Board

The Regression of the Annual Cost of Incomplete Information, λ_k, on the Systematic Risk, β_k, the Residual Risk, σ^2_k, the Market Value of the Common Stock, SZ_k, and the Investor Base, IB_k. Investor Base is proxied by the Number of Analysts following the firm from 1994 to 1996 from MIS Database.

$$\lambda_k = \eta_0 + \eta_1 \sigma^2_k + \eta_2 \text{Ln}(\text{Size}_k) + \eta_3 \text{ Investor Base}_k + \varepsilon_k$$

Regression Variables

σ^2_k	Size_k	Investor Base_k
	Without Orthogonalizing	
0.263319*	0.002610	0.027273
(0.0737)	(0.1549)	(0.1902)
	With Orthogonalizing	
0.156317	-0.128871***	0.103939***
(0.2647)	(0.002)	(0.0001)

* Significant at 10 percent level
** Significant at 5 percent level
*** Significant at 1 percent level