CHAPTER 2

THEORETICAL BACKGROUND

I. FIRM-SIZE EFFECT AND INFORMATION EFFECT

Prior studies (Banz (1981), Reinganum (1981, 1982,1983), Keim (1983), Constantinides (1984), Lustig and Leinbach (1983), Goodmand, D. and Peavy, J., (1986), Chan and Chen (1991) Fama and French (1992), Mukherji, S., Dhatt, M., and Kim, Y. (1997), and others) examine the empirical relationship between the return and the total market value of the common stocks as the proxy for firm size and find that smaller firms have had higher risk adjusted returns, on average, than large firms. Recently, Berk (1995) argues that the size-related regularities in asset prices should not be regarded as anomalies, indeed the size-related measures should be used in cross-sectional tests to detect model misspecifications. This study is supported by the evidence in Japan where Garze-Gomez, Hodoshima, and Kunimura (1998) find that among companies with similar cash flows, the companies with riskier cash flows had lower market values and higher expected returns. However, as compiled by Sinquefield (1991: 45), "Chan and Chen (1988) find that the 'small-firm' effect' disappears if betas are calculated over the entire period of study, rather than over independent subperiods. Handa, Kothari and Wasley (1989) find that using betas from annual, rather than monthly, data causes the market-size variable to lose its explanatory power. While Stoll and Whaley (1983) argue that transaction costs would absorb nearly all the excess returns uncovered by simulation. However, Schultz (1983) tests the Stoll and Whaley framework and concludes that even after trading

costs Banz's results hold. Fouse (1989) and Loeb (1991) revive the trading-cost argument." Basu (1983) states that the size effect practically disappears when returns are controlled for differences in risk and earnings-price ratio. Also, Friend and Lang (1988) mention that the anomalous size effect almost dissappears when quality ranking is used as the risk measure. From the above studies, the question of whether there is size effect or not still remains in question.

Various studies try to investigate possible explanations for the small firm effect. While Chan and Chen (1991) states that the size effect is due to the physical size that the small firms are expected to gain more abnormal return, Berk (1995, 1997), and Garza-Gomez, Hodoshima, and Kunimura (1998) argue that the size effect comes from the risk information that the firms' market value of equity contains, not from the physical size itself. Other explanation on firm size is based on information arguments. Barry and Brown (1983, 1984) argue that securities for which there is relatively little information available may be perceived as riskier securities than are securities for which more information is available. Commensurate with that risk, participants in the market may rationally demand a premium to hold such securities. If so, and if risk is measured empirically without regard to the amount of information available, then there may appear to be 'abnormal' returns for low information securities. To the extent that low market value securities have less information available, it follows that there would appear to be 'abnormal' returns associated with small firms.

For the information effect, various studies find the negative relationship between the level of information and the return. Researchers try to find the proxy for the information content. Eddy and Seifert (1988), and Haw and Kim (1991) concluded that firm size, as represented by the amount of market capitalization, may be proxying for its information environment. Bhushan (1989: 257) mentions in his paper that "Because financial analysts collect and disseminate information about firms, various studies try to relate the issue of analysts following to the information acquisition (Grossman (1976, 1978), Grossman and Stiglitz (1976, 1980), Hellwig (1980), Diamond and Verrecchia (1981), Verrecchia (1982), Admati (1985), Admati and Pfleiderer (1986), Bhushan (1989)" . Also, Shores (1990), Skinner (1990), Brennan and Hughes (1991), Bhushan (1989b), Moyer, Chatfield and Sisneros (1989), and Pearson (1991) use the number of analysts following a firm as a proxy for the level of information. The very first paper, which mentions that the neglected firm as proxied by number of analyst following is negatively related to the common stock return, is Arbel and Strebel (1982), Arbel and Strebel (1983), Arbel, Carvell and Strebel (1983), Arbel (1985), and Carvell and Strebel (1987). They find that firms that are relatively neglected by security analysts exhibited superior market performance compared with those that are intensively researched. They mention that the brand-name stocks are closely followed by financial analysts on a continuous basis while the generic stocks are stocks that analysts do not follow on a regular basis and that may incur information deficiency which results in higher estimation risk regarding the company's performance, its potential, and investors' own eventual benefits as outsiders. Consequently, investors for the generic stocks should be compensated with

higher returns (lower price). Therefore, number of analysts following the firm should be negatively related to the common stock return.

Brown, Richardson, and Schwager (1987) suggest that the superiority of financial analysts over time series models in forecasting earnings is positively related to firm size. Richardson (1984) suggests that the extent of institutional equity holding and analysts following should be positively related to firm size. The positive relationship between the firm size and number of analysts as proxied for information is supported by Bhushan (1989), Moyer, Chatfield and Sisneros (1989), Brennan and Hughes (1991) and Chung, McInish, Wood and Wyhowski (1995).

Study by Marston (1996) using period of listing as the proxy of information find that period of listing is negatively related to return, but there is no significant relationship between return and size. However when the linear analysts following is used as the proxy for information as a regressor on the individual returns, the result turns to be positive, and size turns to be positively related to return significantly. On the other hand, Amihud and Mendelson (1989), using bid-ask spread as the proxy for information, find the insignificant relationship between firm size and return, however, the negative relationship between the return and bid-ask spread is detected. Arbel and Strebel (1983), and Arbel, Carvell and Strebel (1983), and Carvell and Strebel (1987) confirm that there is no small-firm effect, the factors that generate higher return are the degree of neglect and the magnitude of the P/E ratio. Arbel (1985) finds the existence of a small firm effect on an overall basis, however, the neglected firm effect persisted over and above the small firm effect. . So, the question of 'Is the neglected firm

effect just a reflection of the size effect?' or 'Is the firm size the determinant of analyst following?' still remains puzzled.

The research done by Brown, Kleidon, and Marsh (1983), and Keim (1983) shows that the small firm effect is not stable over time. Keim (1983) finds that the average excess return is a monotonically decreasing function of median portfolio size, and a significant discovery is that almost fifty percent of the size effect is directly attributable to January returns. Rozeff and Kinney (1970), Cook and Rozeff (1984), Tinic and West (1984), Gilmer (1988), and Rogalski and Tinic (1986) confirm that the risk premium on the stock market is considerably larger in January than in other months. Studies by Blume and Stambaugh (1983), Reinganum (1983), Barry and Brown (1984), and Lakonishok and Smidt (1984) also find that a significant portion of the size effect occurs in the month of January. January effect is also found in Australia by Brown, Keim, Kleidon, and Marsh (1983), in Canada by Bergers, McConnell, and Schlarbaum (1984), and in Japan by Kato and Schallheim (1985). Many researchers try to find the explanation for the January effect. One explanation is year-end tax-loss selling (Reinganum (1983), Roll (1983), Givoly and Ovadia (1983).) Some investors try to sell stocks at the end of the year in order to benefit from tax losses and minimize their income tax liabilities. This creates the selling pressure and pushes the price down toward the end of December. However, this is not because of any underlying economic problems, soon the depressed stocks are discovered and investors start to buy them and push price up back in January. Other than this explanation, Arbel (1985) explains that January effect is due to the Santa impact. Cash flow is needed at the year-end so it puts pressure on stock selling, and this drives

the price down. Finally, again investors find these depressed stocks and buy them back and prices are then pushed up especially the small market-capitalization stocks. The second explanation by Arbel (1985) is window dressing by money managers . Many money managers try to dress up their portfolios at the end of the year resulting in cleaning or selling the less acceptable, less favored stocks, or the generic stocks. The dominant and most plausible explanation for the January effect by Arbel (1985), and Strebel (1983) is that informational factors are related to seasonality in estimation risk, and also the beginning of the popularity flow for the more successful neglected stocks. They say that 'given the initial high level of information deficiency for neglected stocks, every piece of additional information, on the margin, is critical. Furthermore, in the case of many really neglected companies, the period surrounding the annual report (which is normally the fiscal years ended in December) is often the only time in which any new official information reaches the investment public. The corresponding decline in estimation risk and required return would therefore be greatest among neglected-generic firms, resulting in the highest price increases.' Arbel (1985) says that other researchers found the same phenomenon, but they mistakenly labeled it the 'January-size effect.' Arbel suggests that it is not size but information that matters. Again whether the size effect or information effect dominates the January effect still remains unclear.

II. THE EFFECT OF SYSTEMATIC RISK, FIRM-SPECIFIC RISK, SIZE AND INVESTOR BASE ON THE EXCESS RETURN

Merton (1987) believes that financial models based on frictionless markets and complete information are often inadequate to capture the complexity of rationality in action. The central activities in all areas of finance, and especially in capital markets are the acquisition of information and its dissemination to other economic units and whether so simple an information structure is adequate to describe empirical asset-price behavior depends on both the nature of the information and the time scale of the analysis. He, therefore, develops a two-period model of capital market equilibrium in an environment where each investor knows only about a subset of the available securities and the key behavioral assumption of the model is that an investor uses security k in constructing his optimal portfolio only if the investor knows about security k.

From equation (23) of Merton's model (1987: 493),

$$R_k = R_f + \delta . Var(R_m).\beta_k + (\frac{1}{q_k} - 1).\delta . x_k . \sigma_k^2$$

where R_k = the expected return on security k;

R_f = the risk-free rate of interest;

R_m = the return on the market portfolio;

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

$x_k = V_k/M$ = 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 $\delta = 2$, then:-

$$\frac{\partial(R_k - R_f)}{\partial \beta_k} = \delta . Var(R_m)$$

$$\frac{\partial(R_k - R_f)}{\partial x_k} = (\frac{1}{q_k} - 1).\delta .\sigma_k^2$$

$$\frac{\partial(R_k - R_f)}{\partial \sigma_k^2} = (\frac{1}{q_k} - 1).\delta .x_k$$

$$\frac{\partial(R_k - R_f)}{\partial q_k} = -\frac{\delta .x_k .\sigma_k^2}{q_k^2}$$

then,

$$R_k - R_f = f^n(\beta_k^{+}, \sigma_k^{2}, x_k^{+}, q_k^{-})$$

From the model, Merton (1987) finds that the expected return is an increasing function of the systematic risk which is consistent with the CAPM (Black, Jensen, and Scholes (1972), Fama and MacBeth (1973) and others.) However, the early portfolio theory and the Capital Asset Pricing Model have viewed the risk in the portfolio context. When assets are placed in a portfolio, the only risk that remains in a

well-diversified portfolio is the systematic risk. Variance and standard deviation or firm-specific risk should all be diversified away and will have no effect on the expected return. Many researchers (Friend and Blume (1970), Blume and Friend (1975), Friend, Westerfield, and Granito (1978), and Lakonishok and Shapiro (1984)) try to investigate this point and find out that investor holdings are markedly undiversified. Systematic risk is not the only measure of risk. These studies are consistent with the result of Merton (1987)'s model that the expected return is an increasing function of the residual risk. However, this deviates from CAPM and is rejected by various studies i.e. Fama and Macbeth (1973). The expected return is also an increasing function of the fraction of the market portfolio invested in security k. By using market value of each firm as the proxy for this variable, the prediction is conflict with the empirical findings of Banz (1981), Reinganum (1981), Schwert (1983), and others who find a negative size effect on stock returns However, the empirical results are conditional on only beta, while Merton derives his model conditional on the other variables(σ^2_k, x_k, q_k) other than the beta. On the contrary, the expected return is a decreasing function of the fractions of all investors who know about security k . The prediction is consistent with the study done by Barry and Brown (1984) using period of listing as the proxy, Arbel, Carvell and Strebel (1983) using the degree of institutional holdings as the proxy, Amihud and Mendelson (1989) using bid-ask spread, and others.

III. THE EFFECT OF BETA, SIZE, BOOK-TO-MARKET EQUITY, LEVERAGE AND EARNINGS-PRICE ON EXCESS RETURN

While Merton (1987) argues that CAPM does not hold, not only the systematic risk affects the expected return, but also firm-specific risk, size, and investor base. Fama and French (1992) also report that there are two easily measured variables, size and book-to-market equity, combined to capture the cross-sectional variation in average stock returns associated with market beta, size, leverage book-to-market equity, and earnings-price ratios. And when the tests allow for variations in beta that is unrelated to size, the relation between market beta and average return is flat, even when beta is the only explanatory variable. From these two studies, it is shown that other than the systematic risk or beta, some other variables may be able to better capture the expected return.

Fama and French (1992) study on the four effects that are contradict to CAPM namely:- the small-firm effect evidenced by Banz (1981) and others who find that average returns of small firms are too high given their beta, and large firms earn too low; the second one is the leverage effect documented by Bhandari (1988) who find that leverage helps explain the cross-section of average stock returns in tests that include size and beta. The book-to-market equity ratio effect is the third one. Stattman (1980), Rosenberg, Reid, and Lanstein (1985), and Chan, Hamao, and Lakonishok (1991) find that average returns on U.S. stocks are positively related to the ratio of a firm's book value of common equity to its market value. And finally the earnings-price ratio effect by Basu (1983) and Ball (1978). The studies show that earnings-

price ratios help explain the cross-section of average returns on U.S. stocks. Holding constant beta, observed returns tend to be higher for low P/E ratio stocks and lower for high P/E ratio stocks. This is supported by the empirical evidences by Goodman, and Peavy (1983), Goodman and Peavy (1986), and Jensen, G., Johnson R., and Mercer, J. (1997).

Fama and French (1992: 428) mention that 'studies done by Ball (1978) and Keim (1988) state that variables like size, earnings-price, leverage, and book-to-market equity are all scaled versions of a firms' stock price and they can be regarded as different ways of extracting information from stock prices about the cross-section of expected stock returns. Since all these variables are scaled versions of price, it is reasonable to expect that some of them are redundant for explaining average returns'. They, therefore, try to evaluate the joint roles of market beta, size, earnings-price, leverage, and book-to-market equity in the cross-section of average returns . Their main result is that size and book-to-market equity can capture the cross-sectional variation in average stock returns associated with size, earnings-price, book-to-market equity, and leverage.

IV. FACTORS AFFECTING THE COSTS OF INCOMPLETE INFORMATION

Under the assumption of frictionless markets and complete information, the Capital Asset Pricing Model states that the systematic risk or beta is the only factor that affects the expected return. However, Merton (1987) believes that the quality of

information for all securities may be the same but it is not simultaneously available to all investors, and it incurs some costs to obtain those information. Tracing back to equation (23) of Merton's model (1987:496):-

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

where $\lambda_k=(1-q_k).x_k\delta\sigma^2_k/q_k$

= the equilibrium aggregate cost of incomplete information for security k

$Var(R_m)$ = Variance of Market Return

The following results are obtained:-

$$\frac{\partial \lambda_k}{\partial x_k} = (\frac{1}{q_k} - 1) \cdot \delta \cdot \sigma_k^2$$

$$\frac{\partial \lambda_k}{\partial \sigma_k^2} = (\frac{1}{q_k} - 1) \cdot \delta \cdot x_k$$

$$\frac{\partial \lambda_k}{\partial q_k} = \frac{-\delta \cdot x_k \cdot \sigma_k^2}{q_k^2}$$

then,

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

From Merton (1987)'s model, the cost of incomplete information is a decreasing function of the fraction of all investors who know about security k. With

the higher number of investors who invest in security k, the cost of incomplete information will be reduced. This is evidenced by the empirical findings of Barry and Brown (1984) and Arbel, Carvell, and Strebel (1983), and others. However, the cost of incomplete information turns to be an increasing function of the residual risk. This finding is consistent with empirical findings of Friend, Westerfield, and Granito (1978) which states that expected returns seem to depend on both market risk and total variance. The cost of incomplete information is also an increasing function of the fraction of market portfolios invested in security k. This is contrast to the previous studies that the smaller firms earn higher return than the larger ones (Banz (1981),Reinganum (1981), and others.)

V. FACTORS AFFECTING ANALYSTS FOLLOWING THE FIRM

When agency relationship problems due to the separation of ownership and control exist in the firm, Jensen and Meckling (1976) suggest that monitoring activity has the potential to help reduce the agency costs, and this will reflect in the higher capitalized value of the ownership claims to corporations. The greater the separation of ownership and control, the greater the opportunity that managers will consume perquisite at the expense of the shareholders, and also the greater potential for non-value-maximizing investment by managers. Thus, monitoring activities are required. Many parties can perform this monitoring activity and one of them is the security analysts. The main roles of security analysts are to gather and analyze the data and then disseminate the information to their customers who are finally the current and prospective investors. Because of these pivotal roles of publicizing the information,

monitoring functions are indirectly provided. As a result, it is believed that security analysts can help reduce the agency costs arising from the separation of ownership and control, and this will also increase the value of the firm. Finally, the required returns to compensate for the agency costs demanded from the investors may be lower compared with the firms with no or lower number of analysts following the firm.

Bhushan (1989) develops the simple model of analyst following by deriving the implications for the effects of various firm characteristics on total expenditure by all investors on analyst services for a firm having the number of analysts following a firm as a proxy for this total expenditure. The assumptions behind the model are that the relation between the number of analysts following a firm and the total expenditure by investors on analyst services about that firm is linear and imperfect, both free-riding and resale of analysts services are assumed not to be different from one firm to another, also there are no barriers to entry or exit for analysts services, and all analysts provide services of the same quality.

The equilibrium total expenditure by investors on analyst services for any firm will be a function of various firm characteristics and its dependence on these characteristics arises through either the aggregate demand or the supply function for analyst services (Bhushan (1989b: 258, 272)):-

$$\frac{\partial TC^*}{\partial k_i} = \frac{Q^*[(1+\varepsilon_S)(\partial D/\partial k_i) - (1+\varepsilon_D)(\partial S/\partial k_i)]}{(\partial S/\partial P - \partial D/\partial P)}$$

where TC^* denotes the equilibrium total expenditure by investors on analyst services for a particular firm in a given period

Q^* denotes the equilibrium aggregate demand for analysts services for the firm during this period

ε_D denotes the elasticity of aggregate demand

ε_S denotes the elasticity of aggregate supply

k_i denotes the various firm characteristics that can affect either the aggregate demand or supply function

D denotes aggregate demand

S denotes aggregate supply

P denotes price per unit of analyst services

The aggregate demand and supply functions are:-

$$Q_D = D(P, k_1, k_2, \ldots, k_n)$$

$$Q_S = S(P, k_1, k_2, \ldots, k_n)$$

then,

$$TC^*(k_1, k_2 \ldots, k_n) = P^*(k_1, k_2, \ldots, k_n) Q^*(k_1, k_2, \ldots, k_n)$$

where P^* denotes the equilibrium price

"There is a growing body of research showing financial analysts' forecasts of earnings have informational content and are used by investors (Elton and Gruber (1981), Fried and Givoly (1982), Givoly and Lakonishok (1984)), and also stock prices are influenced more by analysts' forecasts of earnings growth rates than

historical growth rate measures (Cragg and Malkiel (1982), Timme and Eisemann (1986), Linke (1982), Peterson and Peterson (1982), Rozeff (1983), Stanley, Lewellen, and Schlarbaum (1984), and Vander Weide and Carleton (1984)). With the abundant evidences, the proposition that security analysts provide useful inputs to the financial markets is supported. (Moyer, Chatfield, and Sisneros (1989: 503). Many studies, thus, try to determine the endogenous nature of security analysts following the firm.

Bhushan (1989) has identified the firm characteristics that can influence the aggregate demand and supply of analysts services as follow:- Ownership structure proxied by number of institutions holding a firm's shares, percentage of its shares held by these institutions, and degree to which the firm is closely held by insiders (percentage of its share held by insiders); firm size proxied by the market value of the equity of a firm; return variability proxied by the variance of the total return of the firm and the variance of the idiosyncratic return of the firm after removing the effect of marketwide factors; number of lines of business proxied by the number of three-digit SIC codes and the number of four-digit SIC codes corresponding to the firm; and correlation between firm return and market return proxied by the squared correlation coefficient between a firm's return and the market return

Applying Ordinary Least Squares Regression of the number of analysts following the firm on the above variables, Bhushan (1989) find the positive signs on number of institutions holding a firm's shares and the percentage of its shares held by these institutions which is consistent with the interpretation that the aggregate demand and aggregate supply for analyst services increases as more institutions holds shares in

a firm or the percentage held by them increases. The negative sign on the percentage of its share held by insiders is observed and it supports the notion that the demand for analysts services comes from noninsiders. The sign on the firm size is positive and strongly significant. This may imply the increased benefits of private information for larger firms and the increased potential transactions business that larger firms bring to the analysts' companies. The positive sign on return variability may be because expected trading profits are higher for firms with higher return variability. The signs on number of lines of business and the correlation between firm return and market return are negative and positive. With more lines of business, information acquisition costs goes up and more effort has to be put. This may reduce number of analysts to follow such a firm. Information acquisition costs are likely to be an inverse function of the squared correlation coefficient between firm and market returns; therefore, an increase in R^2 between firm and market return should lead to an increase in analysts following.

O'Brien and Bhushan (1991) determine the variables that they expect to be associated with changes in analysts following as follows:- analysts competition proxied by the prior-year level of analyst following; investor interest proxied by the contemporaneous change in institutions holding the stock and the number of institutions holding the stock last year and changes in shares outstanding; volatility proxied by the standard error of excess stock returns (residual standard error from a market-model regression); differential costs of collecting information proxied by net change in the number of firms in the industry, and regulated industries; and stock performance proxied by the market-adjusted return.

They expect positive associations between changes in analysts following and changes in institutional ownership, lagged institutional ownership, changes in shares outstanding, changes in volatility, net entry of firms to the industry, regulation, and stock performance, and expect negative association between changes in analyst following and lagged analyst following. They presume an analyst's benefit will be greatest in firms with little competition from other analysts, and with high investor interest. They also say that informed trading is better concealed in volatile stocks, and if analysts can capture some of these benefits, then increase in volatility should cause an increase in following. They mention that if there are economies of scale in learning about firm's operations then the cost per firm will decline with the number of firms in the industry and they expect that analysts will prefer the regulated industries.

However, using two-stage least squares to run on simultaneous equations having changes in analysts following and changes in institutional ownership as the endogenous variables, the result shows that changes in analysts following appear negatively associated with preexisting analysts following, and positively associated with net change in the number of firms in the industry and regulation as expected. The other variables have no explanatory power and finally volatility turns to be negatively associated with the changes in number of analysts.

Chung, McInish, Wood and Wyhowski (1995) examine the way information affects the bid-ask spread, when the demand for (and supply of) information is endogenous by setting the model to capture the simultaneity of the determinants of analysts following and the bid-ask spread and applying the three stage least squares

method to examine the result. The factors that determine number of analysts are :- bid-ask spreads; trading volume proxied by the average number of transactions and the average transaction size; number of shareholders; share Price proxied by the weighted average of the mid-points of bid-ask spread quotations for the day; multiple listing is defined as zero if the stock is traded only on the primary exchange and one if it is also traded on other exchanges; and firm size proxied by the market value of equity.

They expect positive relation between number of analyst and bid-ask spread, price volatility, trading volume, number of shareholders, multiple listing , and firm size and negative relation with level of share price.

The empirical results are, using the three-stage least squares, as expected. The results provide the empirical support that since the value of private information increases with the degree of information asymmetry about the firm's future prospects, a larger number of analysts following a firm would imply a greater degree of information asymmetry about the firm and thus a higher bid-ask spread. The result also supports the idea that since high trading volume reflects a lack of consensus, the demand for informedness rises with trading volume. Also, the firms with larger investor base and with the multiple listed stocks are followed by more analysts. Their empirical result is consistent with the findings of Brennan and Hughes (1991) that analysts following is negatively associated with share price and positively associated with firm size as the investor is likely to find private information about a larger firm more valuable than the same information about a smaller firm and increase in

transactions in large firm lowers the costs of providing analysts services and thus increase the following.

Moyer, Chatfield, and Sisneros (1989) explore the determinants of monitoring activity provided by security analysts. The empirical results support the role of analysts monitoring as an efficient device for controlling agency-related costs of debt and equity (Jensen and Meckling (1976)) and as a response to the information demands of investors. The determinants of analysts monitoring in their papers are :- insider proxied by the proportion of common stock owned by insiders; growth proxied by the compound annual growth rate in the firm's total assets; debt Ratio proxied by long-term debt divided by total common equity at year-end; owners proxied by the number of owners of a company's common stock at year-end; value proxied by the market value of outstanding shares of common stock at year-end; institution proxied by the percentage of total common shares owned by institutions at year-end, volatility proxied by the standard error of the estimate of earnings per share divided by the mean (predicted) earnings per share; finance industry (commercial bank or savings institution) or not using the dummy variable, and utility industry or not by using dummy variable also.

The expected results are that the greater the insider-ownership percentage in a firm, the less the necessity for extensive monitoring activity, the negative sign is, therefore, expected for the insider. Second, the demand for analyst monitoring services is expected to be greater for high-growth firms than for more established and mature firms. For the high-growth firm, asset base may change very quickly, and it

may permit managers to engage in risk shifting, the need for extensive monitoring is, therefore, required. Also, the amount of security analyst monitoring activity should be positively related to the number of stockholders and to the value of the outstanding shares. With more shareholders, more information will be demanded. At the same time, with more stockholders, there will be more dispersion in ownership and less effective control by the owner; therefore, more monitoring is demanded. The greater the market value of outstanding equity, the greater are the aggregate potential gains to investors having access to the better information provided by analysts; therefore, as the value of the company's stock increases, there should be greater aggregate demand for the services of analysts. The greater the proportion of debt in a firm's capital structure, the more likely it is that strict covenants will be required on a firm's debt. And the more covenants restrict a firm's activities, the less the need for monitoring by analysts. The demand for information by each institutional owner is expected to be greater than the demand for information by an individual investor. Therefore, the amount of security analyst monitoring is expected to be positively related to the proportion of the firm's shares held by institutional investors. Also, the more uncertain a company's future performance, the more value information has , and, thus, the more security analyst monitoring is expected. In finance industry, depositors are insured against losses, and these institutions are regulated to minimize losses to depositors and the insuring agencies, this will increase the incentives for those institutions to adopt more risky operating strategies. With high potential equity risk, investors are expected to demand more monitoring services. At the same time, the regulation of utilities focuses on minimizing the cost of service to consumers. The information emanating from the regulatory process may act as a substitute source of

monitoring for investors, investors in regulated utilities are, therefore, expected to demand less monitoring services. Applying Ordinary Least Squares Regression of the number of analyst earnings on the above explanatory variables, the results are as expected except the volatility variable.

Chung and Jo (1996) find the evidence that security analysts have a stronger incentive to follow stocks of high quality companies. Using three-stage least squares method, their findings are consistent with Bhushan (1989), Moyer,Chatfiled and Sisneros (1989), and Brennan and Hughes (1991) that analyst following is positively associated with firm size, trading volume, and the variability of stock returns, and negatively associated with share price. They also find the positive relationship between analyst following the firm with Tobin's q ratio, advertising ratio and R& D expenditure ratios which are used as the proxies for the quality of the firms.

From the previous literature, the determinants of number of analysts following the firms applicable to Thai Market are:-

1. Return – O'Brien and Bhushan (1991) state that analysts prefer to cover stocks that performed well , therefore, the higher the return, the more number of analysts to follow those firms. However, Brennan and Hughes (1996), and Chung and Jo (1996) find that firms that earn negative return will tend to have a larger analyst following.
2. Volatility – Bhushan (1989), Brennan and Hughes (1991), Moyer, Chatfield, and Sisneros (1989), Chung and Jo (1996), and Chung, McInish, Wood and Wyhoski (1995) find that the expected trading profit based on

private information will be higher for a firm with higher return variability. Also, O'Brien and Bhushan (1991) state that informed trading is better concealed in volatile stocks. The relationship between volatility and number of analysts following is, thus, positive.

3. Size – Private information about a larger firm is more valuable than the same piece of information about a smaller firm because of higher profit from trading, and increase in firm size leads to more transaction business for analysts (Bhushan (1989), Moyer et al.(1989), Brennan and Hughes (1991), Chung and Jo (1996), and Chung et al. (1995)).
4. Number of Institutional holdings and Percentage of shares held by institutions – Bhushan (1989), O'Brien and Bhushan (1991), and Moyer et al. (1989) point out that increase in concentration of ownership will make demand for analysts higher if major of transaction business comes from institutions. On the other hand, if the customers use in-house analysis, then demand for analysts will be lower.
5. Competition – O'Brien and Bhushan (1991) mention that analysts' benefit will be greatest in firms with little competition by linking with commission revenue so analysts expect to derive more benefit from following shares where more trading can be generated. The negative relation between competition and number of analysts is, thus, expected.
6. Debt – Moyer et al. (1989) state that the greater the debt, the more likely that a strict covenants are required. As a result, the higher the debt, the lower the number of analysts will be.

7. Transaction – Chung and Jo (1996), and Chung et al. (1995) mention that high volume typically reflects a lack of consensus, demand for informedness is, therefore, higher. Transaction is, therefore, expected to be positively related with number of analysts.
8. Growth – For the firms with high growth rate, asset base may change quickly and manager may shift the risk to creditors (if risk is increased), or to shareholders (if risk is decreased) (Moyer et al. (1989)). The growth rate is, thus, positively related to number of analysts.
9. Spread – Chung (1995) state that financial analysts deduce the profit potential of a stock from the size of market maker's spread (based on the expectation that spreads would be greater for a stock with greater information asymmetry). As a result, the bigger the spread, the higher the number of analysts will be.
10. Number of shares – Moyer et al. (1989) and Chung et al. (1995) explain that a greater number of stockholders may indicate a greater dispersion of ownership and less effective control by the owners, more analysts are, therefore, required.