

Security Analysts' Monitoring Activity: Does it Reduce Agency Costs?

Ahmad Rizal Mazlan¹ and Nur Adiana Hiau Abdullah²
Universiti Utara Malaysia

Abstract: This study is motivated by the work of Jensen and Meckling who proposed that security analysts play a monitoring role that could help reduce agency costs in companies. The role of security analysts is crucial for market efficiency because they provide relevant information to investors. It is found that for a certain extent, Malaysian security analysts play a monitoring role in reducing agency costs. Furthermore, institutional ownership and size of companies could significantly explain Malaysian security analysts' monitoring activity.

Keywords: Security analysts, agency costs, monitoring, Malaysian stock markets

1. Introduction

Stock market efficiency is a vital investment consideration for investors, especially for those investors dealing with huge amounts of funds, such as mutual fund and pension fund managers. One of the many reasons a stock market can be inefficient is because of the relatively small number of analysts and portfolio managers monitoring the stocks in the market (Madura 2001; Reilly 1994). According to Jensen and Meckling (1976), security analysts play a monitoring role that helps to reduce agency costs associated with the separation of ownership and control. This monitoring role is important to large investors who generally are unable to closely monitor each stock in the market.

Many studies have used the proposition by Jensen and Meckling (1976) as a base for their work. They mainly tested the proposition that security analysts provide useful inputs to the financial markets. From 1978 to the end of the 1980s, many researchers studied the accuracy and relevancy of security analysts' forecasts (Armstrong 1983; Brown and Rozef, 1978; Collins and Hopwood 1980; Givoly and Lakonishok, 1984; Moyer *et al.*, 1985). Others concentrated on the information content of analysts' earnings forecasts in making investment decisions (Elton *et al.* 1982; Givoly and Lakonishok 1984).

During that period, it was also confirmed that stock prices are influenced more by analysts' forecasts of earnings growth rates rather than by historical earnings growth rates (Linke 1982; Peterson and Peterson 1982; Rozeff 1983; Stanley *et al.* 1984; Timme and Eisemann 1986; Vander Weide and Carleton, 1984). Throughout the 1990s, these issues were still analysed (Brous and Kini 1994; and Womack 1996; Allen *et al.* 1997). Basically, most of the earlier and recent studies looked into the role of analysts in an informationally efficient marketplace.

¹ Faculty of Finance and Banking, Universiti Utara Malaysia, 06010 Sintok Kedah, Malaysia.
E-mail: arizal@uum.edu.my

² Faculty of Finance and Banking, Universiti Utara Malaysia, 06010 Sintok Kedah, Malaysia.
E-mail: diana897@uum.edu.my

The role of security analysts as a monitoring device was hardly researched. It was only in the late 1980s and early 1990s that several researchers in the United States started to incorporate the monitoring role of security analysts (Bhushan 1989; Brennan and Hughes 1991; Moyer *et al.* 1989). For example, Moyer *et al.* (1989) have incorporated several indirect measures of agency costs for companies that are followed by security analysts. In the study, they have shown that the extent of monitoring activity performed by security analysts is a positive function of the level of potential agency costs in a company.

Unlike in the western countries, there is lack of research in Malaysia covering the monitoring activity of security analysts with regard to agency costs. Hence, this research is conducted to fill this gap. The objective of this study is to determine whether the monitoring activity performed by security analysts in Malaysia is a positive function of the level of potential agency costs in companies.

The finding as whether Malaysian security analysts successfully perform a monitoring function is vital to investors, particularly large institutional investors. It will testify further on the level of efficiency of the Malaysian stock market, as far as the agency problem theory is concerned. Given the recovery sentiment in the Bursa Malaysia, positive findings of the research will be expected to further restore the confidence of large foreign institutional investors.

The rest of the paper is organised into five sections. Section 2 discusses the theories of agency costs and security analysts' monitoring activity. Section 3 provides empirical evidence on the variables selected as proxies for agency costs. Section 4 describes the research design, followed by the analysis of data in Section 5. The final section provides the conclusion of the study and also discusses the implications as well as limitations of the study.

2. Theories of Agency Cost and Security Analysts' Monitoring Activity

Separation of ownership and management in large businesses is inevitable. Most public listed companies have hundreds or even thousands of shareholders. Therefore, it will be impossible for all of the shareholders to be actively involved in the management of a company. Therefore, the separation of ownership and management allows share ownership to change without interference to the operations of the business. However, if the managers' and shareholders' objectives differ, agency conflicts that create principal-agent problems occur. These problems come with associated costs normally referred to as agency costs.

The work of Williams (1987) explained that the impact on agency costs depends critically on managers' objectives. If managers want to maximise the market value of the company's stock, they will select appropriate projects and consume no perquisites. However, if managers want to maximise their expected personal utility, they will consume excessive perquisites and choose projects of either excessive or insufficient risk. This is detrimental to the value of the company, because projects with insufficient risk provide low returns while excessively risky projects would be too costly to bear.

The study by Dobson (1990) indicated that agency cost that arises from shareholder-manager conflict of interest is non-trivial, while Myers (2000) stressed that agency costs are unavoidable. This means that the cost is not negligible and it affects the overall value of a company. Therefore, monitoring mechanisms are designed in order to control this cost.

According to Huson *et al.* (2001), stockholders rely on internal and external monitoring mechanisms to help resolve agency problems that arise from the separation of ownership and control in companies. Examples of internal monitoring mechanisms are boards of directors and internal auditing. Among the external monitoring mechanisms are corporate cash disbursement methods, cross-sectional divergences in capital structures and debt maturities, external financing arrangements, leveraged buyouts, corporate control innovations and financial intermediations. In addition to the monitoring mechanisms discussed above, another major source of monitoring comes from security analysts.

Security analysts are employed by brokerage companies, merchant banks, unit trusts or research companies to analyse securities in the local or sometimes foreign stock markets. The objective of security valuation is for the analysts to come up with specific recommendations for the stocks they analyse: either a buy, sell or hold recommendation. In his study, Womack (1996) explained that brokerage companies spend hundreds of millions of dollars annually analysing stocks and providing investors with the prospects and outlook of investing in certain stocks. According to Chen *et al.* (2002), the dissemination of information by security analysts can increase investor knowledge of the companies. This view was also shared by Ang and Ma (2001) who argued that financial analysts or security analysts play an important role in smoothing the operation of the capital market.

Based on Jensen and Meckling's proposition (1976), security analysis performed by analysts serves as an external monitoring device in terms of reducing agency costs. It is argued that when the potential agency-related problems in a company are great, analyst research activity should be greater than when potential agency-related costs in a company are low (Moyer *et al.* 1989). Therefore, analysts should be interested in following the stocks of companies in which potential agency costs are greater.

3. Empirical Evidence on Variables Selected as Proxies for Agency Costs

There are several methods used to directly and indirectly measure agency costs in companies. Two direct measurements of agency costs are expense ratio and efficiency ratio while there are many variables that are used to indirectly measure the potential agency costs in companies.

3.1 Insider Ownership

According to Jensen and Meckling (1976), the main source of agency conflict originates from low insider ownership percentage, *i.e.* the proportion of a company's shares held by directors, managers and employees of the company. According to Moyer *et al.* (1989), the greater the separation of ownership and control in a corporation, the greater is the potential agency costs. Greater insider ownership of a company would therefore decrease the agency costs in a company. Therefore, they proposed that the greater the insider-ownership percentage in a company, the less the need for extensive monitoring activity due to the lower potential agency costs in the company. Using multiple regressions, the researchers incorporated other variables that indirectly measure the potential agency costs in companies. Among the variables were growth of company, debt ratio, number of shareholders, size of company, institutional ownership, and volatility of earnings.¹

¹ The other variables will be discussed in the later sections.

The empirical results in Moyer *et al.* (1989) showed that insider ownership has a significant impact on reducing agency costs in a company. This is because, when management and owner interests are closely aligned, the potential agency costs will be reduced. This is in line with the work of Doukas *et al.* (2001), where they concluded that the greater the ownership dispersion of a company, the greater the non-value-maximising conduct by managers, and therefore, the greater the agency costs.

Ang *et al.* (2000) focused on companies owned solely by a single owner-manager. Unlike most other studies that used public-listed companies in their sample, this study used non-publicly traded companies whose data were gathered from the National Survey of Small Business Finances (NSSBF). This data enabled them to analyse the relationship between agency costs and ownership structure for companies whose management owns 100 per cent of equity. Ang *et al.* (2000) produced results that supported the propositions of Jensen and Meckling (1976) and Fama and Jensen (1983) about ownership structure, organisational form, and the alignment of managers' and shareholders' interests. First, agency costs are higher when an outsider manages the company. Second, agency costs vary inversely with the manager's ownership share. Third, agency costs increase with the number of non-manager shareholders.

3.2 Debt Ratio

As pointed out by Jensen and Meckling (1976), the use of debts can reduce the need for outside financing through the issuance of shares, and therefore help diminish the manager-stockholder agency problem. Additionally, the use of debt should reduce the agency problem of over-investment by committing the company to fixed interest payments. According to Jensen (1988), this is so because debt reduces the cash flow available for spending at the discretion of managers. Therefore, a higher debt ratio reduces the need for external monitoring.

The study by Crutchley and Jensen (1999) proved the hypothesis that financial leverage or debt ratio is negatively related to agency cost. By using a sample consisting of data for two three-year periods beginning in 1987 and 1993, the study performed a three-stage least-squares regression.² The results significantly showed that leverage, dividend payout, insider ownership, and institutional ownership were significantly related to agency costs. With an R^2 of 0.40, the study provided sufficient evidence that financial leverage, along with the other three variables, significantly affect agency costs in a company.

In another study, Doukas *et al.* (2001) proposed that agency cost measures should be inversely related to the fraction of debt in the company's capital structure. The results of their study also revealed that the levels of debt play an important role in reducing the non-value-maximising conduct of managers.

The importance of debt ratio was also stressed by Chung *et al.* (2002). Their study focused on earnings management by managers. Debt ratio was included in the test as one of

² In addition to the four dependent variables mentioned, nine independent variables were included: operating risk of company, systematic risk of company, number of operating divisions in company, return on assets, annual sales growth, investment in capital expenditure divided by assets, ratio of fixed assets to total assets, ratio of research and development (R&D) to total assets, and company size.

the control variables, along with cash flow indicator and natural log of total assets. The dependent variable was discretionary accruals, which indirectly measure the potential agency costs in companies. The researchers proved that debt ratio is negatively related to discretionary accruals. This proposition is consistent with previous studies by Becker *et al.* (1998) and DeFond and Park (1997).

3.3 Institutional Ownership

Due to the growing importance of institutional investors as shareholders of public-listed companies, institutional ownership has been included in many studies related to agency costs and monitoring activities of a company. According to Crutchley and Jensen (1999), the spectacular growth of institutional ownership in the US and UK during the 1980s and 1990s has added an additional monitoring mechanism for public-listed companies. Among the notable institutional investors are mutual funds, pension funds and insurance companies. The researchers referred to the studies by Shleifer and Vishny (1986) and Coffee (1991) which have confirmed the monitoring role of institutional investors in reducing agency costs in companies.

According to Doukas *et al.* (2001), agency conflicts between managers and shareholders are likely to be mitigated through the monitoring activities of institutional investors, implying a negative relationship between institutional ownership and agency costs. In another study, Chung *et al.* (2002) investigated whether large institutional shareholding can become an effective monitoring mechanism. The authors expected that the ability of managers to opportunistically manage reported earnings is constrained by the effectiveness of external monitoring by institutional investors. They reasoned that institutions have greater incentives to collect information, monitor management actions and urge better performance due to the relatively large stake they hold in the company. This regression model produced an R^2 of 0.201 with the institutional ownership coefficient being negatively and statistically related with opportunistic earnings management. This result supported the hypothesis of Chung *et al.* (2002) that large institutional shareholdings can prevent managers from being involved in opportunistic earnings management.

A different perspective with regard to institutional investors' role in companies was pointed out by Moyer *et al.* (1989) who stressed the fiduciary responsibilities of institutional ownership. According to them, the use of outside analysts' forecasts to manage portfolio activities is evidence that institutional investors are fulfilling their fiduciary role. 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 (to signal for potential agency costs) is expected to be positively related to the proportion of the company's shares held by institutional investors. By including other variables in the regression analysis³, the results showed that institutional ownership has the expected positive and significant impact on the extent of monitoring activity.

³ The other variables have been mentioned in the earlier section.

3.4 Company Size

According to Doukas *et al.* (2001), agency conflicts are more prominent in larger organisations where the number of managers and shareholders is greater. This would mean there is a positive relationship between size and agency costs. The researchers found that company size is positively and significantly related to agency costs in companies. This was in contrast to the study by Chung *et al.* (2002), where they found a negative and significant relationship between size (natural log of total assets) and agency costs (discretionary accounting accruals). This result was consistent with the studies by Becker *et al.* (1998) and DeFond and Park (1997).

Moyer *et al.* (1989) used the market value of outstanding shares (or market capitalisation) as a proxy for company size. They reasoned that the greater the market value of outstanding equity, the greater the aggregate potential gains to investors from having access to better information provided by analysts. In their study, companies with higher potential agency costs were expected to have greater analyst coverage than companies with lower potential agency costs because theoretically, companies with higher potential agency costs are expected to be monitored more closely. The results in Moyer *et al.* (1989) indicated that size has a positive and significant impact on analyst monitoring, which was consistent with the result reported by Chen *et al.* (2002) and Doukas *et al.* (2001).

3.5 Company Growth

According to Moyer *et al.* (1989), high-growth companies require more monitoring than established and mature companies, because in high-growth companies, the asset-base of the company changes quickly. Rapid changes in a company's asset base allow managers to engage in a risk shifting behaviour due to the availability of larger amounts of assets. This risk shifting behaviour by managers involves agency costs. Therefore, a positive relationship is expected between company growth and agency costs. The research results showed that company growth, proxied by the growth rate of assets, was positively and significantly related to agency costs in companies. This result is in line with earlier works by John (1987) and Kalay (1982), who argued that agency costs should be positively related to a company's growth opportunities.

In addition to asset growth, sales growth has also been incorporated into the measurement of potential agency costs in a company. In the study by Doukas *et al.* (2001), a company's five-year sales growth was incorporated in one of the indicators for interactive variable called 'AGENCY'⁴, which indirectly measured the agency costs in a company. This agency cost variable was regressed against analysts' coverage (NAF) across three forecasting horizons. In general, the coefficient of the NAF variable was negative and highly significant, which contradicted the work of John (1987), Kalay (1982) and Moyer *et al.* (1989).

² In addition to the four dependent variables mentioned, nine independent variables were included: size of company, systematic risk of company, number of operating divisions in company, industry effect, industry concentration, industry growth, industry leverage, industry profitability, and industry age.

⁴ AGENCY is the interaction between company growth opportunities and its free cash flows. Growth opportunities are measured using three alternative dummy variables.

3.6 Expense Ratio

According to Ang *et al.* (2000), expense ratio is considered a direct measurement of agency costs because it measures how effectively company management controls operating costs, including excessive perquisite consumption, and other direct agency costs. Based on Williams *et al.* (1992), among the items considered as operating expenses are salaries, utilities, supplies, advertising, transportation, depreciation and insurance. Most of these items are at the discretion of the management, implying that the managers can overstate the amount of these items to their benefit. Therefore, high operating expenses raise the probability of misuse of funds by the management of a company. In their study, Ang *et al.* (2000) defined expense ratio as operating expense standardised by annual sales, and calculated it as the difference in dollar expenses between a company with a certain ownership and management structure and the no-agency-cost base case company. They were able to conclude that the higher the expense ratio, the higher would be the agency costs in a company.

3.7 Efficiency Ratio

Besides using expense ratio, Ang *et al.* (2000) also incorporated another direct measurement of agency costs – efficiency ratio. This ratio was defined as the ratio of annual sales to total assets. According to Brealey and Myers (2000), a higher efficiency ratio signals a more efficient management team in utilising the company's assets to generate more sales. Specifically, Ang *et al.* (2000) explained that this variable is a proxy for the loss in revenue attributable to inefficient asset utilisation, which can result from poor investment decisions (e.g. investing in negative net present-value assets) or from shirking by management (e.g. exerting too little effort to help generate revenue). Overall, the researchers were able to conclude that the lower the efficiency ratio, the higher the agency costs to a company.

4. Research Design and Test Methodology

A total of 146 companies were included in the International Brokerage Estimates Services⁵ (IBES) earnings forecast database published in *The Edge* as at January 2002. The IBES earnings forecast database was chosen because it contains the number of security analysts following selected companies listed on the Bursa Malaysia. The publication date of January 2002 was chosen because it reflects the analysts' consensus forecasts until the end of 2001. Omitted from the original population list were companies which: (i) were listed under the finance sector/industry, (ii) did not have a complete data for the period of study (1997 – 2001), and (iii) were disposed off or taken over during the period of study. Companies in the finance industry were omitted because they are highly regulated and have different financial statements presentation. As a result, a total of 105 companies were included in the sample.

Table 1 shows the breakdown of the companies in the sample in terms of industry classification as measured in proportion to companies listed on the Bursa Malaysia as of 31

⁵ *The Edge*, in collaboration with Thomson First Call, a financial database company that acquired IBES and Datastream in the year 2000, presented the consensus forecast earnings estimates of selected Malaysian listed companies tracked by major stock broking companies and research offices.

Table 1. Bursa Malaysia industrial classification of sample companies

No.	Industry	Main Board		Second Board	
		Sample	Total Listed	Sample	Total Listed
1	Consumer products	16	61	0	58
2	Industrial products	18	109	1	136
3	Construction	8	34	0	29
4	IPC	3	6	0	0
5	Technology	5	14	0	4
6	Mining	1	6	0	0
7	Trading/services	30	99	2	60
8	Hotel	1	6	0	0
9	Properties	10	81	0	3
10	Plantations	10	81	0	3
	Total	102	531	3	292

December 2001. As can be inferred from the table, the coverage of Malaysian security analysts is mainly focused on companies listed on the Main Board with approximately ninety-three per cent. There were only two companies from the Second Board. In terms of industry classification, almost all of the sectors are covered.

A multiple regression model that is similar to that of Moyer *et al.* (1989) used to explain the number of security analysts monitoring activities. The hypothesised relationship between the number of analysts following (NAF) and its determinants is as follows:

$$\text{NAF} = \alpha + \alpha_1 \text{INSIDER} + \beta_2 \text{DEBTRATIO} + \beta_3 \text{INSTITUTION} + \beta_4 \text{SIZE} + \beta_5 \text{GROWTH} + \beta_6 \text{EXPENSE} + \beta_7 \text{EFFICIENCY} + \epsilon$$

where

- NAF = number of earnings forecasts made by analysts of a company's common stock⁶
- INSIDER⁷ = proportion of common stock owned by insiders at the end of 2001
- DEBTRATIO = long-term debt divided by total common equity at the end of 2001
- INSTITUTION = percentage of total common stocks owned by institutions as at year-end 2001
- SIZE = the natural log (ln) of the market value of outstanding shares of a company's common stock at year-end 2001

⁶ Compiled from *The Edge*/IBES.

⁷ The data for the variables were taken from companies' annual reports and Compustat database services.

GROWTH = compound annual growth rate in company
total assets over a five-year period ending in 2001

EXPENSE = five-year average, ending in 2001 of company
operating expense divided by annual sales

EFFICIENCY = five-year average, ending in 2001 of company
annual sales divided by total assets

The level of security analyst monitoring activity is calculated based on the number of earnings forecasts made by analysts of a company's common stock taken from the Institutional Brokers Estimation Service (IBES) database in January 2002. In Moyer *et al.* (1989), the number of analyst following was regressed against the independent variables that theoretically serve as proxies for potential agency costs in a company. Based on their model, it can be argued that companies with a greater number of analyst following have higher potential agency costs than companies with a smaller number of analyst following. The authors explained that when the potential for, and economic consequences of, agency-related problems in a company are great, analyst research activity should be greater than when potential agency-related costs in a company are low. This is on the back of the hypothesis developed by Jensen and Meckling (1976) that analyst monitoring activity can be explained as a monitoring device in the presence of potential agency problems.

INSIDER is the measurement for insider ownership in a company. It is defined as the officers or directors within the company (Crutchley and Jensen 1999). Theoretically, greater insider ownership will reduce the agency costs in a company. Hence, a negative relationship is expected between number of analyst following, NAF and insider ownership, **INSIDER**.

DEBTRATIO is the degree of financial leverage in a company as at the end of 2001, and is calculated as long term debt divided by total common equity (Moyer *et al.* 1989). The use of debt should reduce the agency problem of over investment by committing the company to fixed interest payments. Since the use of debt can reduce agency cost in a company, an inverse relationship is expected between NAF and **DEBTRATIO**, due to less monitoring required by the analysts for highly levered companies.

INSTITUTION is the proportion of common stocks owned by institutional investors. These institutions include investment companies, insurance companies, trust funds and foundations (Moyer *et al.* 1989). According to Crutchley and Jensen (1999), institutional investors perform a monitoring role and they could help reduce agency costs in listed companies. Therefore, a negative relationship is hypothesised between **INSTITUTION** and NAF.

SIZE represents company size and is calculated as the natural log (\ln) of the market value of outstanding shares of a company's common stock at year-end 2001 (Moyer *et al.* 1989). According to Doukas *et al.* (2001), agency conflicts are more prominent in larger organisations because the number of managers and shareholders is greater. Therefore, a positive relationship is expected between **SIZE** and NAF.

GROWTH is defined as the compound annual growth rate in the company's total assets over the five-year period ending in 2001 (Moyer *et al.* 1989). In high-growth companies, the assets change rapidly and this would allow managers to engage in a risk

shifting behaviour involving agency costs. These costs are usually detrimental to the shareholders and to a certain extent, the creditors. Hence, a positive relationship is expected between GROWTH and NAF.

EXPENSE is defined as the operating expense divided by annual sales (Ang *et al.* 2000). According to the authors, this ratio is a direct measurement of agency costs in a company. In essence, expense ratio measures how effectively the company's management controls operating costs, including excessive perquisite consumption, and other direct agency costs. Theoretically, the higher the expense ratio, the higher would be the agency costs in a company; therefore, a positive relationship is expected between EXPENSE and NAF.

Another direct measurement of agency cost is EFFICIENCY. It is defined as annual sales divided by total assets (Ang *et al.* 2000). According to Brealey and Myers (2000), a higher efficiency ratio indicates a more efficient management team in utilising the company's assets to generate more sales. The higher the efficiency ratio, the lower the agency costs in a company; therefore, a negative relationship is expected between EFFICIENCY and NAF.

5. Analysis of Results

Table 2 shows that the average number of analysts following the stocks is 9.7. The mean percentage of insider ownership is 5.24 per cent with a maximum and minimum ownership of 53.90 per cent and zero per cent, respectively. The average debt ratio proportion is 75.20 per cent. This implies that on average, the amount of long term debts of the sample companies is three-quarter of its total shareholders' equity. For growth, the average is 9.00 per cent with some companies having a 48.70 per cent and -26.90 per cent growth.

Table 2. Descriptive statistics

	NaF	Insider	Debt Ratio	Institution	Size	Growth	Expense	Efficiency
Mean	9.7	0.0524	0.7520	0.2260	20.5700	0.0900	0.9070	0.6520
Maximum	26	0.5390	25.9080	0.8470	24.2270	0.4870	2.7320	2.3340
Minimum	1	0.0000	-0.3202	0.0003	17.7980	-0.2690	0.3680	0.0540
Std Dev	8.5100	0.1150	2.8310	0.1775	1.2804	0.1244	0.2874	0.4555
Skewness	0.5600	2.7880	7.6180	1.6980	0.3010	0.3130	3.1200	1.1040
Kurtosis	-1.2650	7.3700	63.6120	3.0900	0.1400	1.3740	16.4810	1.0140

The mean expense ratio for the five-year average, ending 2001 recorded 90.7 per cent and the five-year average, ending 2001 efficiency ratio was 65.23 per cent. The average institutional ownership percentage (22.60%) was much higher than the insider ownership percentage (5.24%), showing that on average, the companies in the sample were mainly owned by institutional investors, rather than by the insiders and that the institutional ownership was larger than insider ownership by 4.3 times.

Finally, the mean size, which was proxied by the natural log (\ln) of market capitalisation, was 20.57. This shows that at the end of 2001, the average market capitalisation of the companies in the sample was RM858,000,000. The average total sales for 2001 of the sample companies stood at RM1,487,796,919, showing that the average total sales for the

Table 3. Pearson correlation matrix among the variables

	Naf	Insider	Debt Ratio	Growth	Expense	Efficiency	Institution	Size
NAF	1	-0.073	-0.081	0.112	-0.234*	0.095	0.286*	0.774*
INSIDER	-0.073	1	-0.024	0.119	-0.079	0.006	0.027	-0.193*
DEBT RATIO	-0.081	-0.024	1	-0.111	0.286*	-0.180*	-0.320	0.016
GROWTH	0.112	0.119	-0.111	1	-0.339*	0.076	0.037	0.120
EXPENSE	-0.234*	-0.079	0.286*	-0.339*	1	0.002	-0.066	-0.245*
EFFICIENCY	0.095	0.006	-0.180*	0.076	0.002	1	-0.050	0.049
INSTITUTION	0.286*	0.027	-0.032	0.037	-0.066	-0.050	1	0.201*
SIZE	0.774*	-0.193*	0.016	0.120	-0.245*	0.049	0.201*	1

*Significant at $\alpha = 0.05$

companies was 1.73 times greater than the average market capitalisation.

The Pearson Correlation Matrix is shown in Table 3. The dependent variable NAF, which is the size of analyst following, is significantly correlated with three of the independent variables at $\alpha = 0.05$ level. NAF is negatively correlated with EXPENSE (-0.234), and positively correlated with INSTITUTION (0.286) and SIZE (0.774). As for the other independent variables, they were not significantly correlated with NAF.

Among the independent variables, the highest correlation was between GROWTH and EXPENSE. The degree of collinearity for the two variables was -0.339, significant at $\alpha = 0.01$ level. This means when GROWTH moves or changes, EXPENSE changes inversely by approximately 34 per cent. However, when a subsidiary auxiliary regression is executed for GROWTH against the rest of the independent variables and EXPENSE against the rest of the explanations, their degree of collinearity as measured by the coefficient of determinations (R^2) were only 11.5 per cent (F -statistics = 13.38) and 22.3 per cent (F -statistics = 9.68) respectively.

According to Gujarati (1992), multicollinearity may be a problem only if the R^2 obtained from an auxiliary regression is greater than the overall R^2 that is obtained from the regression of the dependent variable on all the regressors. The overall R^2 of the model that will be discussed next will be compared to the R^2 obtained from the auxiliary regression to assess the multicollinearity problem posed by the GROWTH and EXPENSE variables.

Table 4 provides the results of multiple regression analysis of NAF against the independent variables using the enter procedure method, where the regression equation was built up one variable at a time (Myers and Well 1991). The results show that the independent variables in the model could explain 60.4 per cent of the variation in NAF with an F -value of 23.697 and a probability of 0.000. This means that collectively, the determining variables have a significant impact on NAF. Furthermore, compared to the R^2 produced in the subsidiary auxiliary regression of GROWTH and EXPENSE variables (11.5% and 22.3%), the overall R^2 of 60.4 per cent was substantially greater and therefore the collinearity between GROWTH and EXPENSE should not be a problem to the whole model (Gujarati 1992).

Table 4. Multiple regression analysis of NAF and determining variables using the enter procedure method

Variable	Coefficient	Std. Error	t-Statistics	Prob.	Tolerance
INSIDER	4.909	4.718	1.041	0.301	0.929
DEBTRATIO	-0.224	0.198	-1.128	0.262	0.874
INSTITUTION	6.328	3.037	2.084	0.040*	0.949
SIZE	5.023	0.447	11.231	0.000*	0.841
GROWTH	-0.637	4.531	-0.141	0.889	0.867
EXPENSE	-0.502	2.091	-0.240	0.811	0.763
EFFICIENCY	0.950	1.183	0.803	0.424	0.949
R-squared	0.631	Mean dependent var.		9.676	
Adjusted R-squared	0.604	S.D. dependent var.		8.512	
S.E. of regression	5.354 F-statistics			23.697	
Mean square residual	28.671 Prob (F-statistics)		0.000		
Durbin-Watson stat	1.100				

* Significant at $\alpha = 0.05$ level; dependent variable was NAF; sample size was 105

When each determining variable was examined individually while holding the remaining predictors constant, INSTITUTION and SIZE were found to be statistically significant at $\alpha = 0.05$ level to explain the variation in NAF, while the other independent variables were not statistically significant in explaining the variation in NAF.

In addition to the enter procedure method, a stepwise regression was also conducted. The results indicated that 60.9 per cent of the variance in NAF was accounted for by the regression on SIZE and INSTITUTION, with an F -value of 81.852 and a probability of 0.000. This implies that together, SIZE and INSTITUTION can explain the variation in NAF better than when all the other independent variables are included. A high tolerance value of 0.96 for both variables shows that there is no redundancy or multicollinearity problem for both variables.

Based on the coefficients, it can be inferred that, while keeping INSTITUTION constant, for a unit (in this case, one natural log or ln) increase in SIZE, there will be an increase in the number of analyst following the stock by about 6.5 analysts. This positive relationship is as expected and parallel with the findings in Moyer *et al.* (1989) who argued that as monitoring agents, security analysts should be more interested in following larger companies than smaller companies. This result is also in line with Doukas *et al.* (2001), Chung *et al.* (2002) and Chen *et al.* (2002).

For INSTITUTION, it can be inferred that, while keeping SIZE constant, one percentage increase in institutional ownership will result in an increase in the number of analyst following the stock by 5. The positive relationship between INSTITUTION and NAF is consistent with the work of Moyer *et al.* (1989), where institutional ownership in a company was found to be positively related to the number of analysts following the company.

Looking back at Table 3, both INSTITUTION and SIZE are positively and significantly related, and they both are also positively and significantly related to NAF. This suggests that most large public-listed companies have high institutional ownership percentage, in

Table 5. Stepwise regression analysis of NAF and determining variables

Variable	Coefficient	Std. Error	t-Statistics	Prob.	Tolerance
INSTITUTION	4.961	0.416	11.913	0.000*	0.960
SIZE	6.533	3.004	2.174	0.032*	0.960
R-squared	0.616	Mean dependent var.		9.676	
Adjusted R-squared	0.609	S.D. dependent var.		8.512	
S.E. of regression	5.326	F-statistics		81.852	
Mean square residual	28.366	Prob (F-statistics)		0.000*	
Durbin-Watson stat	1.06				

* Significant at $\alpha = 0.05$ level; dependent variable was: NAF; sample size was 105

addition to the large number of analysts following the companies. This is possibly due to the fact that foreign institutional investors such as Morgan Stanley Institutional Fund Incorporated, JP Morgan Flemings Pacific Equity Fund and Baring Global Emerging Markets Fund hire analysts to analyse the stocks listed on the Bursa Malaysia. These hired analysts, combined with the existing security analysts employed by the local brokerage houses resulted in the large total number of analysts following the stocks.

The results of the other variables in the study (INSIDER, GROWTH, DEBT RATIO, EXPENSE and EFFICIENCY) were not statistically significant and these were generally in contrast to the previous studies. INSIDER variable was found to be negatively and significantly related to NAF in Moyer *et al.* (1989) and also in Doukas *et al.* (2001). This study shows that the number of analyst following in Malaysia does not have any significant relationship with the proportion of insider ownership.

Based on the results in Table 4, GROWTH coefficient not only produced an unexpected sign (-0.637), but was also insignificant (probability = 0.889). This result is in contrast to the study by Moyer *et al.* (1989) which concluded that the size of a company was positively and significantly related to the number of analyst following the stock. In Cruthcley and Jensen (1999), growth of a company, which was measured by sales growth, was found to be positively and significantly related with agency costs. In this study, it can be implied that the number of analysts following a stock does not have any significant relationship with company growth. Similarly, with respect to agency costs theory, company growth in Malaysia probably does not signify potential agency costs in a company.

It is also observed that the coefficient of DEBT RATIO produced the expected sign (-0.224), but the *t*-statistic of -1.128 resulted in a probability level of 0.262, therefore failing to reject the null hypothesis of $\beta = 0$. The study by Moyer *et al.* (1989), Cruthcley and Jensen (1999), and Doukas *et al.* (2001) have proven that debt ratio is negatively and significantly related to agency costs in a company. In this study, the number of analysts following a company does not have any significant relationship with company debt level.

The results on both EXPENSE and EFFICIENCY variables in this study are in contrast to the results reported by Ang *et al.* (2000), where expense ratio was found to be positively related to agency costs, while efficiency ratio was found to be negatively related to agency costs. Based on Table 4, the sign of EXPENSE variable is negative, while the sign of

EFFICIENCY variable is positive, and both are not statistically significant. This indicates that the number of analysts following the sample companies do not consider level of expense or efficiency ratios in selecting the stocks to be analysed.

6. Conclusion

By using 105 companies from ten industries listed on the Main Board and Second Board of the Bursa Malaysia in the year 1997 to 2001, seven determining variables were regressed against the number of analysts following the companies (NAF). Institutional ownership (INSTITUTION) and company size (SIZE) were found to have a significant effect in explaining the variation of analyst following in an emerging market such as Malaysia. These variables could explain 60.4 per cent of the variation in NAF with an F -statistics of 23.697 and a probability of 0.000. When a stepwise regression was executed to take into account the multicollinearity problem, INSTITUTION and SIZE continued to have a significant influence on the variation of NAF with an R^2 of 60.9 per cent with an F -statistics of 81.852 and a probability of 0.000. The other independent variables were found to have no significant effect in explaining the variation of NAF for both regressions.

Based on the results, it can be inferred that, while keeping INSTITUTION constant, for a one unit increase in SIZE, there will be an increase in the number of analysts following the company by about 6.5 analysts. For INSTITUTION, it can be inferred that, while keeping SIZE constant, one percentage increase in institutional ownership will result in an increase in the number of analysts following the company by 5. The results show that Malaysian companies with larger market capitalisation and higher institutional ownership have a larger number of analysts following the companies.

Moyer *et al.* (1989) stressed that when the potential agency costs in a company are great, the number of analysts following the stocks is expected to be high, and vice-versa, implying that analyst research activity should be greater in a company with higher potential agency costs. Based on this argument, it can be concluded that companies with larger market capitalisation and higher institutional ownership have greater agency costs because those companies have a greater number of analyst coverage. Therefore, among the seven determining variables selected to measure agency costs in the companies listed on the Bursa Malaysia, only SIZE and INSTITUTION were significant.

As for institutional ownership, its positive relationship with the number of analyst following may be explained by the fiduciary responsibilities assumed by the institutional investors. By assuming fiduciary responsibilities with respect to their clients through their portfolio management activities, the institutional investors used outside analysts' forecasts to show evidence that they are fulfilling their fiduciary role; whereas these institutional investors may have their own analysts. This might explain the higher number of analyst coverage for the companies with larger institutional ownership. The importance of INSTITUTION and SIZE could partially support the contention by Jensen and Meckling (1976) that analyst monitoring activity can act as a monitoring device in the presence of potential agency problems in Malaysian companies.

References

- Allen, Allen, A., J. Y. Cho and K. Jung. 1997. Earnings forecast errors: comparative evidence from the Pacific-Basin capital markets. *Pacific-Basin Finance Journal* 5:115-129.
- Ang, J. S., R. A. Cole and J. W. Lin. 2000. Agency costs and ownership structure. *Journal of Finance* 55(1): 81-106.
- Ang, J. S. and Y. Ma. 2001. The behavior of financial analysts during the Asian financial crisis in Indonesia, Korea, Malaysia and Thailand. *Pacific-Basin Finance Journal* 9: 233-263.
- Armstrong, J. S. 1983. Relative accuracy of judgmental and extrapolative methods in forecasting annual earnings. *Journal of Forecasting* 2:437-447.
- Becker, C. L., M. L. Defond, J. Jiambalvo and K. R. Subramanyam. 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research* 15:1-24.
- Bhushan, R. 1989. Firm characteristics and analyst following. *Journal of Accounting and Economics* 37: 39-65.
- Brealey, R. A. and S. C. Myers. 2000. *Principles of Corporate Finance*. New York: McGraw Hill.
- Brennan, M. and P. Hughes. 1991. Stock prices and the supply of information. *Journal of Finance* 46:1665-1691.
- Brous, P. A. and O. Kini. 1994. The valuation effects of equity issues and the level of institutional ownership: evidence from analysts' earnings forecasts. *Financial Management* 23:33-46.
- Brown, L. D. and M. S. Rozef. 1978. The superiority of analysts' forecasts as measures of expectations: evidence from earnings. *Journal of Finance* 33:1-16.
- Chen, C. R., K. C. Chan and T. L. Steiner. 2002. Are all security analysts equal? *Journal of Financial Research* 25 (3):415-430.
- Chung, R., M. Firth and J. B. Kim. 2002. Institutional monitoring and opportunistic earnings management. *Journal of Corporate Finance* 8:29-48.
- Coffee, J. C. 1991. Liquidity versus control: the institutional investor as corporate monitor. *Columbia Law Review* 91:1277-1368.
- Collins, W. and W. Hopwood. 1980. A multivariate analysis of annual earnings forecasts generated from quarterly forecasts of financial analysts and univariate time series models. *Journal of Accounting Research* 18:349-406.
- Crutchley, C. E. and M. R. H. Jensen. 1999. Agency problems and the simultaneity of financial decision making. *International Review of Financial Analysis* 8 (2):177-198.
- DeFond, M. L. and C. W. Park. 1997. Smoothing income in anticipation of future earnings. *Journal of Accounting and Economics* 23:115-139.
- Dobson, J. 1990. Agency costs in U.S. manufacturing: an empirical measure using X-efficiency. *Journal of Economics and Finance*.
- Doukas, J., C. F. Kim and C. Pantzalis. 2001. Security analysis, agency costs and firm characteristics. *Financial Analysts Journal* 56(6):54-63.
- Elton, E. J., M. Gruber and M. Gultekin. 1981. Expectations and share prices. *Management Science* 27:975-987.
- Fama, E. F. and M. C. Jensen. 1983. Separation of ownership and control. *Journal of Law and Economics* 26:301-325.
- Fried, D. and D. Givoly. 1982. Financial analysts forecasts of earnings: a better surrogate for earnings expectations. *Journal of Accounting and Economics* 4: 85-107.
- Givoly, D. and J. Lakonishok. 1984. The informational content of financial analysts' forecasts of earnings. *Journal of Accounting and Economics* 1:165-185.
- Gujarati, D. N. 1992. *Essentials of Econometrics*. New York: Mc Graw-Hill.
- Huson, M. R., R. Parrino and L. T. Starks. 2001. Internal mechanisms and CEO turnover: a long-term perspective. *Journal of Finance* 56 (6):2265-2297.

- Jensen, M. C. 1988. Takeovers, their causes and consequences. *Journal of Economic Perspectives* 2:21-48.
- Jensen, M. C. and W. H. Meckling. 1976. Theory of the firm: managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics* 3:305-360.
- John, K. 1987. Risk-shifting incentives and signaling through corporate capital structure. *Journal of Finance* 42:623-644.
- Kalay, A. 1982. Stockholder-bondholder conflict and dividend constraints. *Journal of Financial Economics* 10:211-233.
- Linke, C. 1982. Estimating growth expectations for AT&T: a survey approach. *Earnings Regulation under Inflation*. Washington, D.C.: Institute for the Study of Regulation.
- Madura, J. 2001. *Financial Markets and Institutions*. Ohio: South-Western College Pub.
- Moyer, R.C., R. E. Chatfield and P. M. Sisneros. 1989. Security analyst monitoring activity: agency costs and Information demands. *Journal of Financial and Quantitative Analysis* 24 (4):503-512.
- Myers, S. C. 2000. Outside equity. *Journal of Finance* 4(3):1005-1037.
- Peterson, D. and P. Peterson. 1982. The effect of changing expectations upon stock returns. *Journal of Financial and Quantitative Analysis* 17:799-813.
- Reilly, F. K. 1994. *Investment Analysis and Portfolio Management*. Florida: Dryden Press.
- Rozeff, M. S. 1983. Predicting long-term earnings growth: comparisons of expected return models, submartingales and value line analysts. *Journal of Forecasting* 2:425-453.
- Shleifer, A. and R. W. Vishny. 1986. Large shareholders and corporate control. *Journal of Political Economy* 94:461-488.
- Stanley, K. L., W. G. Lewellen and G. G. Schlarbaum. 1984. Further evidence of the value of professional investment research. *Journal of Financial Research* 4: 1-9.
- Timme, S. G. and P. C. Eisemann, P.C. 1986. An evaluation of alternative measures of analysts' forecasts of growth in the constant growth model. *Working Paper* no.3, Center for the Study of Regulated Industry, Georgia State University.
- Vander Weide, J. H. and W. T. Carleton. 1984. Response to the FCC's notice of proposed rulemaking on determining the interstate rate of return: comments of the BellSouth companies. *FCC docket* Nov.:84-800.
- Williams, J. 1987. Perquisites, risk, and capital structure. *Journal of Finance* 42(1):29-44.
- Williams, J. R., K. G. Stanga and W. W. Holder. 1992. *Intermediate Accounting*. Florida: Dryden Press.
- Womack, K. L. 1996. Do brokerage analysts' recommendations have investment value? *Journal of Finance* 51(1):137-167.

Response Asymmetries in the Linkage of Asean-5 Equity Prices

Mansor H. Ibrahim*

International Islamic University Malaysia

Abstract: The paper extends the analysis of the linkage among ASEAN-5 markets to allow for possible asymmetric responses of an ASEAN market to innovations in other ASEAN markets and the US market. Our results suggest that, while there is lack of cointegration or long run co-movements among the ASEAN and US markets, there seems to be substantial short run interactions among them. Central to our analysis, there is some evidence for both magnitude and pattern asymmetries in the movements of ASEAN markets. We document evidence for stronger reaction to market downturns than to market upturns, which is more apparent in the less developed markets of Indonesia and the Philippines. These results have the following implications: first, it pays to diversify in the ASEAN markets for those who have long term investment horizons. Second, the benefits of international portfolio diversification in these markets in the short run are, however, greatly limited. Indeed, these benefits may not be forthcoming when they are mostly needed, i.e. during market downturns. Lastly, international market downturns tend to be more contagious compared to market upturns.

Keywords: ASEAN-5, response asymmetries, market downturns, international diversifications, stock markets, composite index

1. Introduction

Due to its important implications on benefits of international portfolio diversification and financial integration across nations, the linkage among national stock markets is a subject that has motivated a great deal of empirical research. While early studies document evidence indicating low correlations among national stock returns (Grubel 1968; Levy and Sarnat 1970; Lessard 1973; Solnik 1974), more recent studies tend to suggest increasing interactions among them especially after the October 1987 global market crash (Lee and Kim 1993; Arshanapalli and Doukas 1993; Meric and Meric 1997). Accordingly, the noted benefits of international diversification have been greatly undermined. Moreover, increasing integration among national markets means that international financial disturbances are easily transmitted to domestic financial markets, a phenomenon known as “financial contagion”.

Recently, Pagan and Soydemir (2001) contend that national stock markets may not react in the same way to upturns and downturns in other markets. More specifically, this so-called “response asymmetry” by Pagan and Soydemir (2001) suggests stronger reaction of a national market to market downturns than to market upturns in other equity markets. According to them, the presence of asymmetric responses arises from “optimism or pessimism” of investors who, being risk averse, are more concerned about losing their investments during periods of negative returns than gaining during periods of positive returns. Additionally, the differences in market reaction to positive and negative changes in other

* Professor, Department of Economics, International Islamic University Malaysia, Jalan Gombak, 53100 Kuala Lumpur, Malaysia.

Email: mansorhi@iiu.edu.my.