# THE ROLE OF SECURITY ANALYSTS IN REDUCING AGENCY COSTS IN COMPANIES LISTED ON THE KUALA LUMPUR STOCK EXCHANGE

A dissertation submitted to the Graduate School in partial
Fulfillment of the requirements for the degree
Master of Science in Finance
Universiti Utara Malaysia

By

Ahmad Rizal Bin Mazlan

## TABLE OF CONTENTS

**CHAPTER 3: RESEARCH DESIGN AND TEST METHODOLOGY**

## PERMISSION TO USE

In presenting this thesis in partial fulfillment of the requirements for a post graduate degree from Universiti Utara Malaysia, I agree that the University Library may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purposes may be granted by my supervisor or, in their absence, by the Dean of the Graduate School. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without any written permission. It is also understood that due recognition shall be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any material from my thesis.

Requests for permission to copy or to make other use of materials in this thesis, in whole or in part, should be addressed to:

Dean of Graduate School
Universiti Utara Malaysia
06010 UUM Sintok
Kedah Darul Aman

## Abstrak

Disertasi ini mengkaji samada aktiviti kawalan oleh penganalisis sekuriti di Malaysia mempunyai hubungan yang positif dengan tahap kos agensi potensi dalam sesebuah syarikat. Objektif ini adalah berdasarkan cadangan yang dibuat oleh Jensen dan Meckling (1976) yang menyatakan analisis sekuriti yang dihasilkan oleh penganalisis bertindak sebagai alat pengawasan luaran untuk mengurangkan kos agensi. Oleh itu, apabila potensi masalah berkaitan agensi di dalam syarikat adalah tinggi, aktiviti penyelidikan oleh penganalisis dijangkakan lebih banyak, berbanding apabila potensi masalah berkaitan agensi di dalam syarikat adalah rendah.

Berdasarkan kajian-kajian terdahulu, tujuh pembolehubah bersandar telah dipilih sebagai proxi untuk kos agensi, dengan bilangan penganalisis yang menganalisa sesuatu syarikat (NAF) dipilih sebagai pembolehubah tidak bersandar. SIZE, GROWTH dan EXPENSE dijangkakan mempunyai hubungan yang positif dengan NAF, manakala INSIDER, DEBTRATIO, INSTITUTION dan EFFICIENCY dijangka mempunyai hubungan negatif dengan NAF. Dengan menggunakan sampel yang mengandungi 105 buah syarikat yang terkandung di dalam pangkalan data unjuran pendapatan 'International Brokerage Estimates Services' (IBES), yang diterbitkan oleh 'The Edge' pada Januari 2002, sebuah model regresi berganda seperti yang dihasilkan oleh Moyer (1989) telah digunakan bagi menerangkan amaun kawalan penganalisis sekuriti untuk sesebuah syarikat.

Korelasi yang agak tinggi (-0.339) telah direkodkan di antara GROWTH dan EXPENSE. Walaubagaimanapun, regresi subsidiari auxiliari yang dibuat bagi GROWTH dengan pembolehubah-pembolehubah yang lain, dan bagi EXPENSE dengan pembolehubah-pembolehubah yang lain, menghasilkan nilai $R^2$ yang lebih rendah berbanding dengan $R^2$ yang dihasilkan oleh model secara keseluruhan. Ini telah menolak wujudnya masalah kolineariti berganda di antara pembolehubah-pembolehubah di dalam model tersebut. Keputusan ujian regresi berganda menunjukkan nilai $R^2$ adalah 60.9 peratus (nilai F = 81.852 dan kebarangkalian = 0.000). Di kalangan pembolehubah tidak bersandar, hanya INSTITUTION dan SIZE adalah signifikan pada tahap alfa = 0.05.

Keputusan kajian ini merumuskan yang peratus milikan pemegang saham institusi (INSTITUTION) dan saiz syarikat (SIZE) adalah dua faktor yang boleh menerangkan secara signifikan tentang aktiviti kawalselia penganalisis sekuriti di Malaysia dan bagaimana ia mengurangkan kos agensi di dalam syarikat. Oleh itu, bolehlah disimpulkan bahawa, penganalisis sekuriti di Malaysia memainkan peranan kawalan di dalam mengurangkan kos agensi di dalam syarikat yang disenaraikan di Bursa Saham Kuala Lumpur

## Abstract

The objective of this dissertation was to examine whether the monitoring activity performed by security analysts in Malaysia is a positive function of the level of potential agency costs in companies. This objective was based on Jensen and Meckling's proposition (1976) that security analysis performed by analysts functions as an external monitoring device in terms of reducing agency costs. Therefore, 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.

Based on previous studies, seven determining variables were selected as proxies for agency costs, with the number of analysts following a company (NAF) was selected as the dependent variable. SIZE, GROWTH and EXPENSE were expected to be positively related with NAF, while INSIDER, DEBTRATIO, INSTITUTION and EFFICIENCY were hypothesized to be negatively related to NAF. Using a sample of 105 companies that were included in the International Brokerage Estimates Services (IBES) earnings forecast database published in The Edge as at January 2002, a multiple regression model that was similar to that of Moyer et al. (1989) was used to explain the amount of security analysts monitoring of individual companies.

A relatively high correlation (-0.339) was recorded between GROWTH and EXPENSE. However, a subsidiary auxiliary regression performed for GROWTH against the rest of the independent variables and EXPENSE against the rest of the explanators produced $R^2$ figures that were relatively smaller than the overall $R^2$ of the model. This rejected a multicollinearity problem among the determining variables in the model.

For the multiple regressions using enter procedure method, the results produced an $R^2$ of 60.4% with an F-value of 23.697 and a probability of 0.000. Among the independent variables, only INSTITUTION and SIZE were statistically significant at alpha = 0.05. Next, when a stepwise regression was conducted, the results indicated that the adjusted $R^2$ improved to 60.9% (F-value of 81.852 and a probability of 0.000), and INSTITUTION and SIZE once again became the only significant explanatory variables.

The findings concluded that institutional ownership and size of companies were the factors that can significantly explain Malaysian security analysts monitoring activity in reducing the agency costs in companies. Therefore, to a certain extent, Malaysian security analysts play the monitoring role in reducing the agency costs in companies listed on the KLSE.

## ACKNOWLEDGEMENTS

I would like to express my heartiest gratitude to my supervisor, Associate Professor Dr. Nur Adiana Hiau Abdullah, for dutifully and relentlessly guiding me into completing this dissertation. Her complete support and commitment has made the journey of completing this dissertation an invaluable learning process.

I would also like to extend my gratitude to the Dean, lecturers and staff of School of Finance and Banking, Universiti Utara Malaysia, for directly or indirectly helping me in completing this dissertation.

## LIST OF TABLES

## LIST OF FIGURES

## LIST OF APPENDICES

# CHAPTER ONE

## INTRODUCTION

This chapter provides the preface and overview for this dissertation and it consists of seven sections: background and objective of the study, justification of the study, significance of the study, organization and outline of the dissertation, summary of the findings, and the conclusion of the chapter.

### 1.1 Background and objective of the Study

Stock market efficiency is a vital investment consideration for investors, especially for those investors dealing with huge amount 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 (Reilly, 1994; Madura, 2001). The number of analysts is crucial especially to foreign investors because, even though these investors have their own security analysts, they also have to rely on other analysts, particularly when they invest in foreign markets, such as Malaysia. These analysts would advice the investors pertaining to the investment activities and would generally come up with specific recommendations on stocks.

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 by security analysts is important to large investors, who generally are unable to closely monitor each stock in the stock market. While there is sufficient evidence in the US and the UK that security analysts' activity is influenced by the demand for information and plays an important role in reducing agency costs in companies, such study is lacking in Malaysia. Thus the objective of this dissertation is to examine the extent to which Malaysian security analysts serve as monitoring agents in reducing the potential agency costs in Malaysian companies.

## 1.2 Justification of the Study

Many researches 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. For instance, ever since 1978 until the end of 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, Chatfield and Sisneros, 1985). Several others concentrated on the information content of analysts' earnings forecasts in making investment decisions (Elton, Gruber and Gultekin, 1981; Fried and Givoly, 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 growth rates measures (Linke, 1982; Peterson and Peterson, 1982; Rozeff, 1983;

Stanley, Lewellen and Schlarbaum, 1984; Timme and Eisemann, 1986; Vander Weide and Carleton, 1984). Throughout the 1990s, these issues were still analyzed (Brous and Kini, 1994; and Womack, 1996; Allen, Cho and Jung, 1997). Basically, most of the earlier and recent studies looked into the role of analysts in an informationally efficient marketplace.

The role of security analysts as a monitoring device when agency relationship problems exist is hardly covered. It was only in the late 1980s and early 1990s that several researchers in the United States have examined the determinants of security analysis that incorporated the monitoring role of security analysts (Bhushan, 1989; Brennan and Hughes, 1991; Moyer et al., 1989). For example, Moyer and his colleagues have incorporated some measures of agency costs for companies that are followed by security analysts. Their findings have proven 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 regards to agency costs. Therefore, there is a gap in the literature on the monitoring role of security analysts in reducing agency costs in companies. Apart from the gap in the literature, this research will be conducted because of the growing importance of the Malaysian stock market as a major capital market in Asia. Thus, the objective of this dissertation 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.

## 1.3 Significance of the Study

This research will examine security analyst monitoring activity and its effect in reducing agency costs of companies in the Malaysian setting. There has been no study in Malaysia that specifically looks into the monitoring role of the security analysts and agency costs in companies. Therefore, this study will contribute to the body of knowledge because it will investigate the gap in the previous literatures.

The findings of whether Malaysian security analysts successfully perform monitoring function are 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 bearish sentiment in the Kuala Lumpur Stock Exchange at the moment, positive findings of the research will be expected to restore the confidence of large foreign institutional investors.

## 1.4 Organization of the Dissertation

The whole dissertation consists of five chapters. In chapter two, an overview of the agency cost theory will be provided. The separation of ownership and management in a company is vital for the business to run smoothly, but it invites agency conflicts between the shareholders (principal) and the management (agent). These conflicts bring about agency costs in a company and empirical studies have shown that the costs are not negligible. To reduce

the agency costs, monitoring mechanisms, either internally or externally, are often created within an organization.

Then, chapter two will provide some explanation on security analysis done by security analysts and how they are considered as external monitors that can reduce agency costs. It will also discuss in detail all the variables selected as proxies to measure agency costs in a company. The variables are: insider ownership, debt ratio, institutional ownership, size of company, growth of company, expense ratio and efficiency ratio.

Chapter three will describe the research design and methodology; within which the research paradigm and method selected will be justified. Multiple regressions model that utilizes the variables discussed and selected in chapter two will be constructed for testing. The sample selected for this study will be described, along with the variables chosen to measure analysts monitoring and also agency costs in a company.

In chapter four, the analysis of data will focus on the coefficient of determination ($R^2$), correlation among the variables and also coefficient of each variable (Rao, 1976; and Haitovsky, 1969). The sign of the coefficients of the variables will be compared to the sign expected in the literature review discussion in order to verify or reject the earlier propositions or hypotheses. Significant testing will use a 5% level of type I error (Maddala, 1988).

Finally, chapter five will conclude this dissertation. Conclusions on the objective of the dissertation with respect to the multiple regressions model

tested will be provided in detail. This final chapter will also lie down the implications of the study on regulators and investors. Finally, limitations of the dissertation and also recommendations for further research will be provided.

## 1.5 Summary of the findings

Using Pearson Correlation, the number of analyst following (NAF), which is the dependent variable in the model, is significantly correlated with three of the independent variables at alpha = 0.05 level. NAF is negatively correlated with expense ratio (EXPENSE) and positively correlated with institutional ownership (INSTITUTION) and size of the company (SIZE). As for the other independent variables, they are not significantly correlated with NAF. A relatively high correlation (-0.339) is recorded between two of the determining variables in the model, growth of the company (GROWTH) and expense ratio (EXPENSE). However, a subsidiary auxiliary regression performed for GROWTH against the rest of the independent variables and EXPENSE against the rest of the explanators produced $R^2$ figures that are relatively smaller than the overall $R^2$ of the model. This rejects a multicollineariy problem among the determining variables in the model.

For the multiple regressions, when the enter procedure method is used, the results show that the independent variables in the model could explain 60.4% of the variation in NAF with an F-value of 23.697 and a probability of 0.000. Among the independent variables, only INSTITUTION and SIZE are statistically significant at alpha = 0.05 level to explain the variation in NAF, while the other independent variables are not statistically significant. Next,

when a stepwise regression is conducted, the results indicate that the adjusted $R^2$ improves to 60.9% (F-value of 81.852 and a probability of 0.000), and INSTITUTION and SIZE once again become the significant explanatory variables. 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 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 6.5. The results of the other independent variables in the study (INSIDER, GROWTH, DEBTRATIO, EXPENSE and EFFICIENCY) are not statistically significant.

## 1.6 Conclusion

This chapter has laid the foundations for the dissertation. It introduced the background and objective of the Study. Then the research was justified and its significance is explained. The methodology was briefly described and justified and the dissertation was outlined. On these foundations, the dissertation can proceed with a detailed description of the research.

# CHAPTER TWO

## LITERATURE REVIEW OF AGENCY COST AND SECURITY ANALYSTS' MONITORING ACTIVITY

This chapter consists of three sections. Section 2.1 will provide an overview of agency cost theory. Section 2.2 will give some explanation on security analysis done by security analysts and how they are considered as external monitors that can reduce agency costs. Finally, section 2.3 will discuss in detail all the variables selected as proxies to measure agency costs in a company.

### 2.1 An overview of agency cost theory

Separation of ownership and management in large businesses is considered inevitable. Most public listed companies have hundreds or even thousands of shareholders. Logically, 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 interfering with the operation 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.

Agency costs are incurred when (1) managers do not attempt to maximize a company's value and (2) shareholders incur costs to monitor the managers' activities (Brealey and Myers, 2000). According to Ariff, Shamser and Annuar (1998), managers may pursue a course of action congruent with management's perceived interests or their perceptions of corporate self-interest rather than those of the shareholders. The authors analyzed board composition, risk, and chief executive officer duality characteristics to address the agency problem faced by shareholders of Malaysian companies. The empirical results of Ariff et al. (1998) showed that there is a conflict of interest, albeit a weak one, between operating managers and shareholders' representatives in the board of directors.

The work of Williams (1987) explained that the impact on agency costs of both bonds and stocks depends critically on corporate insiders' or simply, managers' objective. Consider a company that has just sold a bond and stock to finance its current investment. If managers maximize the market value of their personal stock, then they pick excessively risky projects but consume no perquisites. However, if managers maximize their expected personal utility from perquisites plus residual cash, then they consume excessive perquisites but pick 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.

According to Kim and Sorenson (1986), agency theory that discusses the agency costs resulting from principal-agent conflict can be classified as either

positive or normative agency theory[1]. The normative agency theory mainly focuses on the development of optimal contracts between the principal and the agent. The positive theory of agency is concerned with corporate behavior in the presence of the principal-agent problem. 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, some kind of monitoring is expected in order to control this cost. Based on Huson, Parrino and Starks (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. External monitoring mechanisms are plenty. According to Dobson (1990) financial markets contain several external-monitoring mechanisms to minimize agency costs in companies. Among the monitoring mechanisms created in the financial market 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.

[1] According to Jensen (1983), normative theory focused on policy prescription for management or public policy – for example, questions involving the appropriate treatment of inflation, exchange rates, inventories, leases and so on. On the other hand, positive theory is interested in maximizing the value of a firm by estimating either explicitly or implicitly how such accounting procedures will affect firm value.

In addition to the monitoring mechanisms created in the financial market given above, another major source of monitoring comes from security analysts. This dissertation focuses on the role of security analysts as a monitoring mechanism in reducing agency costs in companies. The next section will discuss in detail on this issue.

## 2.2 Security analysis as an external monitoring device

Security analysts are employed by brokerage companies, merchant banks, unit trusts or research companies to analyze securities in the local or sometimes foreign stock markets. To perform the valuation of companies, the analysts have to vigorously analyze various aspects of the companies and keep track of any major development that can affect the companies' value. The objective of security valuation is for the analysts to come up with specific recommendations for the stocks they analyze: either a buy, sell or hold recommendations. The paper by Womack (1996) described that brokerage companies spend hundreds of millions of dollars annually analyzing stocks and providing investors with the prospects and outlook of investing in certain stocks.

Security analysis builds on factual sources of company-specific information such as annual reports and earnings announcements (Womack, 1996). The author stressed that buy and sell recommendations follow from predictions of stock values using all available sources of industry and company-specific information, could offer a direct test of the ability of well-informed market participants to outperform the stock market averages.

According to Chan and Chen (2002), security analysts monitor the companies they follow by accumulating and analyzing corporate information and disseminating the information to institutional and individual investors. Hence, this could increase investors' 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. The analysts' data collection effort helps the stock market achieve greater transparency by coaxing information out of management, and by demanding greater uniformity in financial reporting to facilitate comparison of companies in the same industry.

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 to follow the stocks of companies in which the potential agency costs are greater.

A framework developed by Brennan and Hughes (1991) and Chung (2000) suggested that the analysts' role is that of a marketing aid to brokers. Analysts provide tools, such as forecasts and recommendations that help brokers maximize transaction profits. This dissertation's framework is similar to that of Moyer et al. (1989) and Doukas, Kim and Pantzalis (2001), in which analysts act as monitors of management performance so as to control agency problems.

This section has put forward arguments on how security analysis function as an external monitoring device in terms of reducing agency costs. Discussion on the variables selected to measure agency costs will be provided in the next section.

## 2.3 Variables selected as proxies for agency costs

The agency-related problems in a company have been discussed in numerous literatures, and there are several methods used to directly and indirectly measure agency costs in companies. There are only two direct measurements of agency costs, which are expense ratio and efficiency ratio; whereas there are many variables that are used to indirectly measure the potential agency costs in companies. Some of them are: insider ownership, institutional ownership, company's growth, leverage, company's size, dividend payout, cash flow, maturity structure of debt, and number of shareholders. Each of these variables will be discussed in detail in the following section.

### 2.3.1 Insider ownership

Based on Jensen and Meckling (1976), the main source of agency conflict originated from low insider ownership percentage, i.e., the proportion of a company's shares held by directors, managers and employees of the company. Therefore, insider ownership or insider holding is one of the most common variables used in the later studies involving agency costs.

According to Moyer et al. (1989), the greater the separation of ownership and control in a corporation, the greater is the potential for excessive perquisite

consumption and non-value-maximizing investment behavior by managers. Greater insider ownership of the 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[2].

The empirical results showed that insider ownership has the expected negative and significant impact in reducing agency costs in a company. The results are consistent with the view that management interests would coincide with other equity owners' interests if the insiders own a sufficient amount of the equity. Therefore, when management and owner interests are closely aligned, the potential agency costs will be reduced.

The work of Doukas et al. (2001) also supports Jensen and Meckling proposition. The inclusion of insider ownership variable captured the aligned interests between insiders and shareholders. They concluded that the greater the ownership dispersion of the company, the greater the non-value-maximizing conducts by managers, and therefore, the greater the agency costs. Therefore, it is expected that the larger the ownership stakes by insiders, the lower the agency cost.

---

[2] The other variables will be discussed in the later sections.

Ang, Cole and Lin (2000) deployed the zero-agency-cost base case defined by the original Jensen and Meckling agency theory as the company owned solely by a single owner-manager. Unlike most other studies that used public-listed companies in their samples, this study used non-publicly traded companies since they are owned by the management. The data were gathered from the National Survey of Small Business Finances (NSSBF), which collected data from a nationally representative sample of small businesses. These data enabled them to analyze the relationship between agency costs and ownership structure for companies whose management owns 100 percent of equity, a prerequisite for the no-outside-equity agency-cost base case.

Ang et al. (2000) postulated the following hypotheses derived from agency theory when compared to the base case: (i) agency costs are higher at companies whose managers own none of the company's equity, (ii) agency costs are inversely related to the manager's ownership stake, and (iii) agency costs are an increasing function of the number of non-manager shareholders. The researchers then used two direct measures of agency costs: expense ratio and efficiency ratio[3]. The difference in both ratios is the agency costs. This was done for companies whose managers are the sole equity owners and also for companies whose managers own less than 100 percent equity. Hence, this would mean a company managed by a 100 percent owner theoretically incurs zero agency costs. Ang et al. (2000) produced results that supported the propositions of Jensen and Meckling (1976) and Fama and Jensen (1983) theories about ownership structure, organizational form, and the alignment of

[3] These two ratios will be discussed in section 2.3.6 and 2.3.7 respectively.

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.

However, Crutchley and Jensen (1999) have proven that a very high percentage of stock held by managers could result in managerial entrenchment, whereby managers may not likely to be affected by any mechanism created in the financial markets. The managerial entrenchment theory states that increasing ownership to a point at which managers become entrenched will actually increase agency costs (Morck, Shleifer and Vishny, 1988; McConnel and Servaes, 1990; Schooley and Barney, 1994; Wansley, Collins and Dutta, 1996). Therefore, by using, the quadratic function from McConnell and Servaes (1990) and Schooley and Barney (1994), Crutchley and Jensen (1999) found that agency costs decline with increases in managerial ownership to a point, but after entrenchment occurs, agency costs increase with increases in managerial ownership.

Basically, all of the studies discussed in this section have confirmed Jensen and Meckling's (1976) predictions that agency costs are higher among companies that are not wholly owned by their managers, and these costs increase as the equity share of the owner-manager declines.

### 2.3.2 Debt ratio

In addition to insider ownership, debt ratio or financial leverage is another variable regularly used to indirectly measure the potential agency costs in a company. As pointed out by Jensen and Meckling (1976), the use of debt can reduce the need for outside financing through the issuance of shares, and therefore help diminish the manager-stockholder agency problem. Theoretically, the use of debt should reduce the agency problem of over investment by committing the company to fixed interest payments. In trying to meet such obligation, it has the effect of motivating managers and their organizations to be efficient. According to Jensen (1988), this is so because debt reduces the cash flow available for spending at the discretion of managers. Accordingly, a higher debt ratio implies lower managerial discretion over free cash flows and, hence, a reduced need for external monitoring.

The study by Cruthcley and Jensen (1999) proved that financial leverage significantly controls agency costs. In addition, they also included dividend, insider ownership, and institutional ownership to determine agency costs. All the variables were hypothesized to be negatively related to agency costs. By using a sample consists of data for two three-year periods beginning in 1987 and 1993, the study performs a three-stage least-squares regression[4].

[4] 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's size.

The results showed that the four decisions – leverage, dividend payout, insider ownership, and institutional ownership – are 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 in the study, significantly affect the agency costs in a company.

Debt ratio was also one of the variables used in the study performed by Doukas et al. (2001). Measured as long-term debt divided by total assets, this variable was used to control for the monitoring role of debt on manager's discretion over free cash flows. According to the authors, agency cost measures should be inversely related to the fraction of debt in the company's capital structure. The results of their study indeed revealed that the levels of debt play an important role in reducing the non-value-maximizing conduct of managers.

The importance of debt ratio is also covered by Chung et al. (2002). Their study focused on earnings management by managers by way of increasing or decreasing reported profits. This self-serving behavior of corporate managers entails agency costs in companies. As one of the control variables, debt ratio was included in the test, along with cash flow indicator and natural log of total assets as a proxy for size. The dependent variable was discretionary accruals, which indirectly measures the potential agency costs in companies. The researchers proved that debt ratio is negatively related to discretionary accruals, which is an indirect measure of agency costs. This proposition is consistent with previous studies by DeFond and Park (1997) and Becker, Defond, Jiambalvo and Subramanyam (1998).

In essence, the proportion of debt used in a company's capital theoretically reduces the agency costs because the use of debt reduces the free cash flows available to the managers. Most of the studies discussed in this section have hypothesized and confirmed that the levels of debt and agency costs in a company are negatively related.

### 2.3.3 Institutional ownership

Besides insider ownership and debt ratio, institutional ownership has been included in many recent studies related to agency costs and monitoring activity of a company. This is possibly due to the growing importance of institutional investors as shareholders of public-listed companies. According to Crutchley and Jensen (1999), the spectacular growth of institutional ownership in the US and UK in 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) that confirmed the monitoring role by large shareholders such as institutional investors in reducing agency costs in companies. According to Pozen (1994), besides actively working to affect corporate policy decisions, institutional investors use other methods such as informal discussion with the management to proxy fights for control of the company.

In addition to institutional ownership variable, the research by Crutchley and Jensen (1999) incorporated three other independent variables (insider ownership, debt ratio and dividend) that are hypothesized to have some effects

on agency costs. The results supported the idea that institutional ownership is a monitoring device that can reduce agency costs in a company.

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. The empirical results showed a negative and significant sign of the institutional ownership coefficient.

In another study, Chung, Firth and Kim (2002) investigated the determinants of earnings management by managers who either increase or decrease reported profits. The authors argued that the earnings management by managers involved agency costs in companies, and they 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 stakeholders such as institutional investors.

Furthermore, Chung et al. stated that Monks and Minow (1995) explained that institutional investors have the opportunity, resources, and ability to monitor, discipline, and influence managers of companies. 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. The regression model in Chung et al. (2002) above produced an $R^2$ of 0.201 with the institutional ownership coefficient being negatively and

statistically related with opportunistic earnings management (significant at 0.01 level). This result supported the hypothesis by the researchers that large institutional shareholdings in a company can prevent managers from involving in opportunistic earnings management.

A different perspective with regards to institutional investors' role in companies was pointed out by Moyer et al. (1989), who stressed on the fiduciary responsibilities of institutional owners of a company common stock. According to them, by assuming fiduciary responsibilities with respect to their clients through their portfolio management activities, the institutional investors use outside analysts' forecasts to show evidence that they 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 analysis[5], the results showed that institutional ownership has the expected positive and significant impact upon the extent of monitoring activity.

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. The next sub-section will

[5] The other variables have been mentioned earlier in section 2.3.1.

explain another variable (company's size) that can indirectly measure agency costs.

### 2.3.4 Size of company

Company's size is often used as one of the determining variables in financial research. In agency theory research, company's size is included because researchers are interested to investigate how size affects agency costs in a company. According to Doukas et al. (2001), agency conflicts are more prominent in larger organizations where the number of managers and shareholders are greater. This would mean there is a positive relationship between size and agency costs. The researchers used the book value of total assets as a proxy for size, and they found that it is positively and significantly related to the agency costs in companies.

In the study by Chung et al. (2002), natural log (ln) of total assets is used as a proxy for size rather than the book value of total assets. This variable was included as a control variable because institutional shareholders were unlikely to be the sole determinant of agency costs in a company. The authors stressed that a negative and significant relationship was reported between size and agency costs (that was measured by discretionary accounting accruals). This is in contrast to Doukas et al. expectation on a positive relationship, but in line with previous studies by Becker et al. (1998) and DeFond and Park (1997).

Moyer et al. (1989) came up with a different measurement for size. Instead of using total assets, the market value of outstanding shares (or market

capitalization) was used as a measurement of company's size. The authors reasoned that the greater the market value of outstanding equity, the greater are the aggregate potential gains to investors from having access to better information provided by analysts. In their study, companies with higher potential agency costs are 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 empirical results in Moyer et al. (1989) reported that size has a positive and significant impact on analyst monitoring, which is consistent to the result reported by Doukas et al. (2001).

The premise in Moyer et al. (1989) regarding the market value or market capitalization was also supported by Chan and Chen (2002) who stressed that security analysts monitor the companies they follow by accumulating and analyzing corporate information and disseminating the information to investors. This process, in turn, can identify weak management teams. Therefore, Chan and Chen (2002) argued that this monitoring effect suggests that the market value of a company should be positively related to the number of security analysts following a company.

Basically, agency conflicts are more prominent in larger firms where the number of shareholders and managers are greater. All of the studies discussed in this section have hypothesized and confirmed that size of a firm and agency costs are positively related. With this respect, a positive relationship is expected between size and agency costs in companies. In the next section, the

fifth indirect measurement of agency costs, company's growth, will be discussed.

### 2.3.5 Company's 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 behavior due to the availability of larger amount of assets. Moyer et al. argue that this risk shifting behavior by managers involve agency costs. Therefore, a positive relationship is expected between company's growth and agency costs. The research results showed that company's growth, proxied by the growth rate of assets, was positively and significantly related to agency costs in companies. This result was in line with earlier works by Kalay (1982) and John (1987), which argued that agency costs (in the form of restrictive bond covenants) should be positively related to a company's growth opportunities.

In addition to asset's 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), company's five-year sales growth was incorporated in one of the indicators for interactive variable called 'AGENCY'[6], which indirectly measures the agency costs in a company. This agency cost variable was regressed against analysts' coverage (NAF) across three forecasting horizons.

[6] AGENCY is the interaction of the company's growth opportunities and its free cash flows. The growth opportunities are measured using three alternative dummy variables.

In general, the coefficient of the NAF variable is negative and significant at the 5 percent level and better. The coefficients of the NAF variable are – 0.0016 ($\chi^2$ of 20.67), -0.0011 ($\chi^2$ of 29.14) and –0.0009 ($\chi^2$ of 15.51) for the one-quarter, one-year and two-year forecasting horizons, respectively. Since growth variable was included in the interactive AGENCY variable in the regression, it can be hypothesized that a company's growth is negatively related with its agency cost.

In addition to the studies mentioned above, Crutchley and Jensen (1999) also incorporated company's sales growth as one of the determining variables that could explain agency costs. In their study, company's sales growth was incorporated as an independent variable, along with eight other independent variables and four dependent variables[7]. The authors expected that companies that were growing rapidly retain their earnings rather than pay high levels of dividends. Therefore, growth would be expected to be negatively related to dividends. Low dividends may result in higher free cash flows, and therefore may entail excessive spending by managers. This would cause agency conflicts to exist. Therefore, in this sense, company's growth is expected to be positively related to agency costs in companies.

The negative relationship between company's growth and its agency costs is explained and proven by the studies discussed in this section. The next two sections will discuss the two direct measurements of agency costs: expense ratio and efficiency ratio.

[7] The details of the variables have been explained in section 2.3.2.

### 2.3.6 Expense ratio

According to Ang et al. (2000), expense ratio variable is considered a direct measurement of agency costs in a company because it measures how effectively the company's management controls operating costs, including excessive perquisite consumption, and other direct agency costs. Based on Williams, Stanga and Holder (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 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 standardized by annual sales, and is calculated as the difference in dollar expenses between a company with a certain ownership and management structure and the no-agency-cost base case company.

The results by Ang et al. (2000) supported propositions made by Jensen and Meckling (1976) and Fama and Jensen (1983) about ownership structure, organizational form, and the alignment of managers' and shareholders' interests. First, they found that agency costs are higher when an outsider manages the company. Second, they found that agency costs vary inversely with the manager's ownership share. Third, they discovered that agency costs increase with the number of nonmanager shareholders. More importantly, by utilizing the expense ratio variable, the researchers were able to conclude that

the higher the expense ratio, the higher would be the agency costs in a company.

### 2.3.7 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 utilizing the company's assets to generate more sales. In another aspect, Ang et al. (2000) explained that this variable is a proxy for the loss in revenues attributable to inefficient asset utilization, which can result from poor investment decisions (e.g., investing in negative net-present-value assets) or from management's shirking (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 in a company.

## 2.4 Summary of the chapter

This chapter starts off with section 2.1 by providing an overview of the agency cost theory. Basically, the inevitable separation of ownership and management in large corporations allows agency conflicts that create agency costs to occur. It was shown that agency cost that arises from shareholder-manager conflict of interest is unavoidable, non-trivial, not negligible and it affects the overall value of a company. Therefore, some kind of monitoring is expected in order to control this cost. Section 2.1 then explains the many types of internal and external monitoring mechanisms that are created to help reduce agency costs,

focusing on the monitoring activity by security analysts that is discussed in detail in section 2.2. The proposition on security analysts' monitoring activity is based on Jensen and Meckling's proposition (1976) that security analysis performed by analysts functions as an external monitoring device in terms of reducing agency costs. Therefore, 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).

Consequently, the chapter proceeds to section 2.3, which provides a detail discussion on the literature review of the variables selected as proxies for agency costs. The seven determining variables selected for this dissertation are: insider ownership, debt ratio, institutional ownership, size of a company, growth of a company, expense ratio and efficiency ratio. Agency costs are expected to be higher among companies that are not wholly owned by their managers. The proportion of debt used in a company's capital theoretically reduces the agency costs because the use of debt reduces the free cash flows available to the managers. Several studies have shown that institutional investors perform the monitoring role that can reduce agency costs in a firm. However, Moyer et al. (1989) argued that due to the fiduciary responsibilities of institutional investors, the demand for information by these investors is expected to be greater than the demand for information by an individual investor. Therefore, the amount of security analyst monitoring (to signal for agency costs) is expected to be positively related to the proportion of the company's shares held by institutional investors.

Since agency conflicts are more prominent in larger firms where the number of shareholders and managers are greater, all of the studies discussed in this section have hypothesized and confirmed that size of a firm and agency costs are positively related. With this respect, a positive relationship is expected between size and agency costs in companies. High-growth companies require more monitoring than mature companies because in high-growth firms, the asset base of the companies changes rapidly and it allows managers to engage in risk-shifting behavior that would cause agency costs to occur. Growth is also expected to be negatively related to dividends. Low dividends may result in higher free cash flows, and therefore may entail excessive spending by managers. Therefore, company's growth is expected to be positively related to agency costs in companies. Expense ratio is expected to be positively related to agency costs and finally, efficiency ratio is expected to be positively related to agency costs.

# CHAPTER THREE

## RESEARCH DESIGN AND TEST METHODOLOGY

The previous chapter has thoroughly discussed the measurements or proxies for agency costs in companies and also the variables expected to influence the demand for analyst monitoring activity. This chapter continues with a discussion on the selection of the companies for the sample of this study, describe the model used to analyze the data, and define the measurement of each variable to be used in the model.

### 3.1 Population and Sample of the Study

A total of 146 companies were included in the International Brokerage Estimates Services (IBES) earnings forecast database published in The Edge as at January 2002. This is the population defined for the study. The IBES earnings forecast database is chosen because it contains the number of security analysts following selected companies listed on the KLSE. The publication date of January 2002 is chosen because it reflects the analysts' consensus forecasts until the end of 2001, which is the point of interest in this study. Based on the population, a narrowed sample is created using several omission criteria. Omitted from the original population list are companies which:

1) are listed under the finance sector/industry

2) do not have a complete data for the period of study (1997 – 2001)

3) are disposed off or taken over during the period of study.

Companies in the finance industry are omitted because they are highly regulated and have different financial statements presentation. As a result, a total of 105 companies are included in the sample and the list of the sample with their industry classification is provided in Table 1.

**Table 1: List of companies in the sample of the study**

| No | Name of Company | NAF | Listing | Industry Classification |
|---|---|---|---|---|
| 1 | ACP Industries Bhd | 6 | Main Board | Industrial Products |
| 2 | AIC Corporation Bhd | 8 | Main Board | Technology |
| 3 | Amway (M) Holdings Bhd | 16 | Main Board | Trading/Services |
| 4 | Asas Dunia Bhd | 1 | Main Board | Properties |
| 5 | Asia File Corporation Bhd | 2 | Main Board | Consumer Products |
| 6 | Asiatic Development Bhd | 4 | Main Board | Plantations |
| 7 | Austral Amalgamated Bhd | 3 | Main Board | Properties |
| 8 | Bandar Raya Developments Bhd | 4 | Main Board | Properties |
| 9 | Berjaya Sports Toto Bhd | 24 | Main Board | Trading/Services |
| 10 | British American Tobacco (M) Bhd | 25 | Main Board | Consumer Products |
| 11 | Bumi Armada Bhd | 1 | Main Board | Trading/Services |
| 12 | Carlsberg Brewery M'sia Bhd | 19 | Main Board | Consumer Products |
| 13 | Celcom Bhd | 22 | Main Board | Trading/Services |
| 14 | Cement Ind. Of Malaysia Bhd | 5 | Main Board | Industrial Products |
| 15 | Computer Systems Advisers (M) Bhd | 12 | Main Board | Technology |
| 16 | Crest Petroleum Bhd | 2 | Second Board | Trading/Services |
| 17 | Cycle & Carriage Bintang Bhd | 11 | Main Board | Consumer Products |
| 18 | Dialog Group Bhd | 2 | Main Board | Trading/Services |
| 19 | Diperdana Holdings Bhd | 1 | Main Board | Trading/Services |
| 20 | Eastern Pacific Ind.Corp. Bhd | 1 | Main Board | Trading/Services |
| 21 | Edaran Otomobil Nasional Bhd | 16 | Main Board | Trading/Services |
| 22 | ENG Teknologi Holdings Bhd | 8 | Main Board | Technology |
| 23 | Fraser & Neave Hldg Bhd | 6 | Main Board | Consumer Products |
| 24 | Gamuda Bhd | 23 | Main Board | Construction |
| 25 | Genting Bhd | 24 | Main Board | Trading/Services |
| 26 | Golden Hope Plantations Bhd | 19 | Main Board | Plantations |
| 27 | Guthrie Ropel Bhd | 1 | Main Board | Plantations |
| 28 | Hap Seng Consolidated Bhd | 3 | Main Board | Trading/Services |
| 29 | Highlands & Lowland Bhd | 1 | Main Board | Plantations |

| No | Name of Company | NAF | Listing | Industry Classification |
|---|---|---|---|---|
| 30 | Hong Leong Industries Bhd | 6 | Main Board | Consumer Products |
| 31 | Hume Industries (M) Bhd | 5 | Main Board | Industrial Products |
| 32 | IGB Corporation Bhd | 3 | Main Board | Properties |
| 33 | IJM Corporation Bhd | 11 | Main Board | Construction |
| 34 | IOI Corporation Bhd | 22 | Main Board | Plantations |
| 35 | IOI Properties Bhd | 21 | Main Board | Properties |
| 36 | Jaya Tiasa Holdings Bhd | 2 | Main Board | Industrial Products |
| 38 | JT International Bhd | 19 | Main Board | Consumer Products |
| 40 | KFC Holdings (M) Bhd | 12 | Main Board | Trading/Services |
| 41 | Kian Joo Can Factory Bhd | 10 | Main Board | Industrial Products |
| 42 | KL Kepong Bhd | 22 | Main Board | Plantations |
| 43 | Konsortium Logistik Bhd | 4 | Main Board | Trading/Services |
| 44 | Kulim (M) Bhd | 1 | Main Board | Plantations |
| 45 | Kumpulan Guthrie Bhd | 7 | Main Board | Plantations |
| 46 | Land&General Bhd | 2 | Main Board | Properties |
| 47 | Leader Universal Holdings Bhd | 1 | Main Board | Industrial Products |
| 48 | Lingui Development Bhd | 7 | Main Board | Industrial Products |
| 49 | Magnum Corporation Bhd | 20 | Main Board | Trading/Services |
| 50 | Malakoff Bhd | 23 | Main Board | Trading/Services |
| 51 | Malayan Cement Bhd | 15 | Main Board | Industrial Products |
| 52 | Malayawata Steel Bhd | 2 | Main Board | Industrial Products |
| 53 | Malaysia Mining Corp Bhd | 4 | Main Board | Mining |
| 54 | Malaysian Airline System Bhd | 22 | Main Board | Trading/Services |
| 55 | Malaysian Oxygen Bhd | 9 | Main Board | Industrial Products |
| 56 | Malaysian Pacific Industries Bhd | 23 | Main Board | Technology |
| 57 | Malaysian Resources Corp. Bhd | 4 | Main Board | Trading/Services |
| 58 | Matsushita Electric Co (M) Bhd | 1 | Main Board | Consumer Products |
| 59 | MBM Resources Bhd | 7 | Main Board | Trading/Services |
| 60 | Mitrajaya Holdings Bhd | 1 | Main Board | Construction |
| 61 | Nanyang Press Holdings Bhd | 2 | Main Board | Trading/Services |
| 62 | Nestle (Malaysia) Bhd | 16 | Main Board | Consumer Products |
| 63 | Oriental Holdings Bhd | 12 | Main Board | Consumer Products |
| 64 | OYL Industries Bhd | 9 | Main Board | Consumer Products |
| 65 | Palmco Holdings Bhd | 1 | Main Board | Industrial Products |
| 66 | Per. Otomobil Nasional Bhd | 24 | Main Board | Consumer Products |
| 67 | Petronas Dagangan Bhd | 3 | Main Board | Trading/Services |
| 68 | Powertek Bhd | 16 | Main Board | IPC |
| 69 | PPB Oil Palms Bhd | 7 | Main Board | Plantations |
| 70 | Puncak Niaga Holdings Bhd | 13 | Main Board | IPC |
| 71 | Ramatex Bhd | 1 | Main Board | Industrial Products |
| 72 | Renong Bhd | 3 | Main Board | Construction |
| 73 | Resorts World Bhd | 25 | Main Board | Trading/Services |
| 74 | Road Builder (M) Holdings Bhd | 24 | Main Board | Construction |
| 75 | Sapura Telecommunications Bhd | 3 | Main Board | Technology |
| 76 | SCB Developments Bhd | 7 | Main Board | Plantations |
| 77 | Shangri-La Hotels (M) Bhd | 1 | Main Board | Hotel |
| 78 | Sime Darby Bhd | 22 | Main Board | Trading/Services |
| 79 | Sime UEP Properties Bhd | 19 | Main Board | Properties |
| 80 | Sistem Televisyen M'sia Bhd | 1 | Main Board | Trading/Services |
| 81 | Southern Steel Bhd | 1 | Main Board | Industrial Products |

| No | Name of Company | NAF | Listing | Industry Classification |
|---|---|---|---|---|
| 82 | SP Setia Bhd | 14 | Main Board | Properties |
| 83 | STAR Publications (M) Bhd | 21 | Main Board | Trading/Services |
| 84 | Sunrise Bhd | 1 | Main Board | Properties |
| 85 | Sunway Building Technology Bhd | 1 | Main Board | Industrial Products |
| 86 | Sunway City Bhd | 4 | Main Board | Properties |
| 87 | Sunway Holdings Incorp. Bhd | 5 | Main Board | Construction |
| 88 | Tai Kwong Yokohama Bhd | 1 | Second Board | Industrial Products |
| 90 | Tan Chong Motor Holdings Bhd | 20 | Main Board | Consumer Products |
| 91 | Tanjong PLC-U | 24 | Main Board | Trading/Services |
| 92 | Telekom Malaysia Bhd | 15 | Main Board | Trading/Services |
| 93 | Tenaga Nasional Bhd | 26 | Main Board | Trading/Services |
| 94 | The New Straits Times Press | 18 | Main Board | Trading/Services |
| 95 | Time Engineering Bhd | 2 | Main Board | Trading/Services |
| 96 | Tractors (M) Holdings Bhd | 10 | Main Board | Industrial Products |
| 97 | Transmile Group Bhd | 7 | Second Board | Trading/Services |
| 98 | UMW Holdings Bhd | 20 | Main Board | Consumer Products |
| 99 | Unza Holdings Bhd | 1 | Main Board | Consumer Products |
| 100 | WCT Engineering Bhd | 2 | Main Board | Construction |
| 101 | WTK Holdings Bhd | 6 | Main Board | Industrial Products |
| 102 | Yeo Hiap Seng Bhd | 3 | Main Board | Consumer Products |
| 103 | YTL Cement Bhd | 1 | Main Board | Industrial Products |
| 104 | YTL Corporation Bhd | 22 | Main Board | Construction |
| 105 | YTL Power Int'l Bhd | 22 | Main Board | IPC |

NAF = number of analysts following the company as at 28 January 2002

Table 2 shows the break down of the companies in the sample in terms of industry classification as measured in the proportion of the whole companies listed on the KLSE. As can be inferred from the table, the coverage of Malaysian security analysts is mainly focused on stocks on the Main Board. Approximately ninety three percent of the sample selected are listed on the Main Board, whereas only seven percent represents the Second Board. Nevertheless, the sector coverage is wide, with almost all of the sectors are covered in their analyses, but again the concentration goes to the companies listed on the Main Board. As of Jan 28, 2001, there are only two industries from the Second Board comprising of three companies that are covered by the analysts. The companies included are one from the Industrial Product and two from Trading/Services.

**Table 2: KLSE Industrial Classification of Sample Companies**

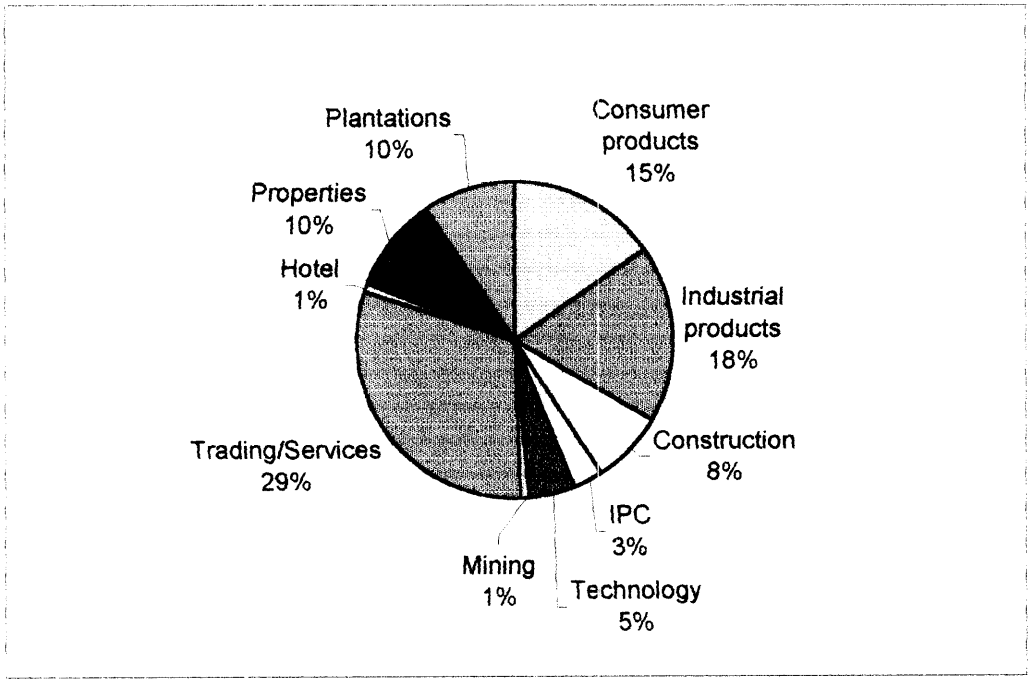
| No | Industry | Main Board | | Second Board | |
|---|---|---|---|---|---|
| | | Total in Sample | Total Listed | Total in Sample | Total Listed |
| 1 | Consumer product | 16 | 61 | 0 | 58 |
| 2 | Industrial product | 18 | 109 | 1 | 136 |
| 3 | Construction | 8 | 34 | 0 | 29 |
| 4 | IPC | 3 | 6 | 0 | 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 |

Based on Table 2, although Trading/Services has the largest number of companies in the sample (thirty companies), this number represents only 30.37 percent of the total number of companies in the Trading/Services sector listed on the Main Board of the KLSE. On the Main Board, there are 61 companies listed under the Consumer Product sector, of which about 26.23 percent or 16 companies are covered by analysts. Out of the total 109 companies in the Industrial Product sector on the Main Board, analysts follow eighteen companies or approximately 16.51 percent. Construction sector has 34 companies on the Main Board and eight companies or about 25.53 percent are covered by analysts. IPC sector has only six companies and three of them or equivalently 50% are followed by analysts. Technology sector comprised of fourteen companies and five companies or approximately 35.72 are covered by analysts. In both Mining and Hotel industries, analysts cover only one company, equivalent to about 16.67 percent of the total 6 companies in those industries. Finally, in both Properties and Plantations industries, analysts

follow ten companies, or approximately 12.35 percent of the total 81 companies in those two industries.

Figure 1 displays the pie chart of the industry classification of the companies in the sample. Based on this figure, the highest number of companies comes from the Trading/Services industry, which represents about 29 percent of the companies in the sample. Industrial products industry is next in line with 18 percent of the sample.

**Figure 1: Industry classification of the companies covered by the analysts on IBES/The Edge on 28 January 2002**




Consumer products industry has 15 percent, while properties and plantations industries have 10 percent representation in the sample. Construction industry companies constitute 8 percent of the sample, technology industry companies

make up 5 percent; while both hotel and mining industries constitute only 1 percent of the sample.

Before discussing about the test methodology of the study, the next sub-section will provide some description of the International Brokerage Estimates Services (IBES) database that is used in this study.

### 3.1.1 International Brokerage Estimates Services (IBES)

The Edge, in collaboration with Thomson First Call, a financial database company that acquired IBES and Datastream in the year 2000, presents the consensus forecast earnings estimates of selected Malaysian listed companies tracked by major stock broking companies and research offices. An example of The Edge/Thomson First Call Earnings Table is provided in Appendix 1, while the list of all stock broking companies in Malaysia is provided in Appendix 2.

First Call is a real-time database created by First Call Corporation of Boston, which collects the daily commentary of portfolio strategists, economists, and security analysts and sells it to professional investors through an on-line PC-based system. The major benefit of First Call is that it is convenient, centralized source of quasi-private news. According to Womack (1996), the major advantage of First Call to researcher is that it provides the specific date (and the approximate time) that information is made available to investors. Other sources of brokerage information (such as Investext and Zacks data) rely on coding of the written reports that are released by the brokerage companies, which may produce two specific inclusion errors. First, not all comments made

by brokerage analysts become disseminated as written reports; second, written reports are often dated some time after the periods that they reflect. Hence, the use of The Edge/Thomson First Call Earnings database would assure the accuracy of the number of analysts following the companies, which is an important variable to be used in this study.

## 3.2 Methodology

Positivism paradigm is chosen for this research because the research hypotheses are stated in propositional form and are subjected to empirical testing (Guba and Lincoln, 1994). Furthermore, positivism approach is also appropriate to be used in a heavily bounded theoretical framework (Bacharach, 1989), such as this research, in order to verify certain hypotheses.

Multiple regressions, a quantitative method that falls under the positivism paradigm, is selected because this research seeks to identify the cause-and-effect relationships among variables and the research problem has already been narrowly defined (Zikmund, 2000). In addition, multiple regression technique offers the advantage of allowing researchers to utilize more of the information available to them to estimate the dependent variable (Levin, 1994).

### 3.2.1 Test methodology

A multiple regression model that is similar to that of Moyer et al. (1989) is used to explain the amount of security analysts monitoring of individual companies. The hypothesized relationship between the number of analysts following (NAF) and its determinants that have been discussed in Chapter 2 is as follows:

$$NAF = \alpha + \beta_1 INSIDER + \beta_2 DEBTRATIO + \beta_3 INSTITUTION + \beta_4 SIZE + \beta_5 GROWTH + \beta_6 EXPENSE + \beta_7 EFFICIENCY + \epsilon$$

where,

NAF = the number of earnings forecast made by analyst of a company's common stock[8]

INSIDER = the 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 = the 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

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

[8] Since The Edge/IBES compiles all the earnings forecasts submitted by analysts on the selected companies, it is able to determine the number of analysts following each of the companies in the database. This information is presented in the publication under the column entitled 'Number of Estimates'.

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

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

The amount of security analyst monitoring activity will be calculated based on the number of earnings forecast made by analyst of a company's common stock. Using the Institutional Brokers Estimation Service (IBES) database for January 2002, the number of analyst following (NAF) will become the dependent variable in the model. The number of analysts following the stocks is used in the work of Moyer et al. (1989), Crutchley and Jensen (1999) and Doukas et al. (1996).

In Moyer et al. (1989), the number of analysts following is regressed against the independent variables that theoretically serve as proxies for the potential agency costs in a company. When the potential agency costs in a company is great, the number of analysts following the stocks is expected to be high, and vice-versa. Therefore, the number of analysts following can indirectly measure the potential agency costs in a company. Based on the model developed by Moyer et al. (1989), it can be argued that companies with greater number of analysts following have higher potential agency costs than companies with smaller number of analysts following. The authors explained that when the potential for, and economic consequences of, agency-related problems in a company is

great, analyst research activity should be greater than when potential agency-related costs in a firm 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 and is calculated as the proportion of common stock owned by insiders as at the end of 2001. Insiders are 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. Therefore, it is 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. Hence, a negative relationship is expected between the number of analyst following, NAF and the 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). Theoretically, 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. It is calculated as the percentage of total common stocks owned by

institutions as at year-end 2001. These institutions include investment companies, insurance companies, trust funds and foundations (Moyer et al., 1989). In Malaysia, examples of local institutional investors are state-owned pension fund, which is Employee Provident Fund (EPF), national unit trust company, which is Perbadanan Nasional Berhad (PNB), special-purpose funds such as the Pilgrimage Fund (Lembaga Urusan Tabung Haji), insurance companies, and state funds such as Amanah Saham Johor. Examples of foreign institutional investors are Morgan Stanley Institutional Fund Incorporated, JPMorgan Flemings Pacific Equity Fund and Baring Global Emerging Markets Fund 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 hypothesized between INSTITUTION and NAF.

SIZE is the measurement of company's 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 organizations because the number of managers and shareholders are 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 behavior 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 the average expense ratio in a company over the five-year period ending 2001. It is defined as the operating expense divided by annual sales (Ang et al., 2000). According to the authors, this ratio and the following ratio (EFFICIENCY) are 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 costs, as mentioned above is EFFICIENCY. It is calculated as the average efficiency ratio in the company over the five-year period ending in 2001. Efficiency ratio 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 utilizing 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.

The data for the variables are taken from companies' annual reports and Compustat database services. The calculation of financial variables is done

using Excel Millennium Edition and the multiple regressions will be performed using SPSS 10.0. The list of companies in the sample of this study along with the accompanying data for all the variables is provided in Appendix 3. The analysis of data focuses on the correlation among the independent variables and the coefficient of determination ($R^2$). The correlation is needed to check on the collinearity among the independent variables to ensure multicollineariy problem does not exist. As for the multiple regression analysis, the sign of the variables' coefficients will be compared to the sign expected in the literature review discussion in order to verify or reject the earlier propositions or hypotheses. Significant testing will use a 5% level of type I error (Maddala, 1988).

### 3.3 Summary of research design and test methodology

This chapter describes the research design and methodology of this dissertation. Justification for the research paradigm and method selected for this study is provided. The population of this study is the 146 companies that are included in the International Brokerage Estimates Services (IBES) earnings forecast database published in The Edge as at January 2002. From this population, 105 companies are selected as the sample of this study based on several selection criteria. A brief description on the International Brokerage Estimates Services (IBES) earnings forecast database is also provided. Then, a multiple regression model that is similar to that of Moyer et al. (1989) is used to explain the amount of security analysts monitoring of individual companies. The amount of security analyst monitoring activity is proxied by the number of earnings forecast made by analyst of a company's common stock. Using the Institutional Brokers Estimation Service (IBES) database for January 2002, the number of

analyst following (NAF) becomes the dependent variable in the model, while the variables chosen to measure agency costs in a company as described in Chapter 2 become the independent variables. The calculations of the independent variables are presented along with the description and justification for inclusion in the model.

# CHAPTER FOUR

## ANALYSIS OF RESULTS ON THE REGRESSION OF NAF AGAINST THE DETERMINANTS OF AGENCY COSTS

The first three chapters have explained the background of agency costs theory and how it relates to the security analysts monitoring activity. Relevant theoretical issues from previous literature have been discussed and a regression model that tests the theoretical determining variables has been presented. This chapter will discuss in depth the results of the regression test starting with descriptive analysis, correlations among the determining variables and finally, regression analysis.

### 4.1 Descriptive statistics

Results of the descriptive analysis are provided in table 3 below. Overall, there are 105 companies included in the sample of this study. The average number of analysts following the stocks in the sample is 9.7, with 26 and 1 as the maximum and minimum number of analysts following, respectively. The standard deviation for the number of analysts is 8.51. The mean percentage of insider ownership or INSIDER is 0.0524 or 5.24%. The largest percentage of insider ownership is 53.90% and the minimum is 0%. The standard deviation of insider ownership variable is 0.115.

The average debt ratio proportion is 0.75, with standard deviation of 2.83. The average debt ratio of 0.75 implies that on average, the amount of long-term debt of the company in the sample is three-quarter of its total shareholders' equity. The maximum debt ratio is 25, which means that the company's long-term debt is 25 times larger as compared to its total shareholders' equity, and the minimum debt ratio is 0. For growth, the average is 0.0904 or 9.04%, with a standard deviation of 0.1244 or 12.44%. The largest growth recorded is 48.7% and the lowest growth is –26.9%.

**Table 3: Descriptive statistics**

| | NAF | INSIDER | DEBT RATIO | INSTITU-TION | SIZE | GROWTH | EXPENSE | EFFI-CIENCY |
|---|---|---|---|---|---|---|---|---|
| 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 |
| Skew-ness | 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 reported is 0.907, with a standard deviation of 0.2874. This implies that on average, the operating expense of the company in the sample is 90.7% of its sales. The average efficiency ratio is 0.6523, with a standard deviation of 0.4555. This shows that on average, the total sales of the

companies in the sample are approximately 65% of their total assets. In other words, the total assets are 1.53 times larger than the total sales.

The average institutional ownership percentage is much higher than the insider ownership percentage, showing that on average, the companies in the sample are mainly owned by institutional investors, rather than by the insiders. The mean institutional ownership is 0.2260, with a standard deviation of 0.1775, while the average insider ownership is 0.0524, with a standard deviation of 0.1150. This means the average institutional ownership is larger than insider ownership by 4.3 times among the companies in the sample of this study. Table 4 provides the frequency distribution of institutional ownership among the companies in the sample. From the table, it is obvious that about 83.80 percent of the companies in the sample are owned at least 10 % by the institutional investors.

Among the major local institutional investors are Employee Provident Fund (EPF), Perbadanan Nasional Berhad, Pilgrimage Fund Board, the Ministry of Finance, the Central Bank, insurance companies, private unit trusts and state-owned unit trusts funds. The stakes by these investors can be substantial; for instance, Employee Provident Fund owns approximately 11.38% of Telekom Berhad and 7.30% of Tenaga Nasional Berhad as at the end of 2001. This translates to approximately RM3.6 billion and RM2.4 billion respectively, in terms of market capitalization. As for the foreign institutional investors, there are Morgan Stanley Institutional Fund Incorporated, JP Morgan Flemings Pacific Equity Fund and Baring Global Emerging Markets Fund. For

illustrative purpose, foreign shareholding statistics as at the end of 2001 that appeared in Investors Digest is provided in Appendix 4.

**Table 4: Frequency distribution of institutional ownership percentage among the companies in the sample**

| Insider ownership | No of companies | % of Total |
|---|---|---|
| 0 - 10 % | 17 | 16.20% |
| 11 - 20 % | 40 | 38.10% |
| 21 - 50 % | 40 | 38.10% |
| 51 - 100% | 8 | 7.60% |

Finally, the mean size, which is proxied by the natural log (ln) of market capitalization, is 20.57, with a standard deviation of 1.28. This shows that as at the end of 2001, the average market capitalization of the companies in the sample is RM858,000,000. The average total sales for 2001 of the companies in the sample stood at RM1,487,796,919, showing that the average total sales for the companies in the sample is 1.73 times greater than the average market capitalization.

### 4.2 Correlations among the variables

The Pearson Correlation Matrix is shown in Table 5 below. The dependent variable NAF, which is the number of analyst following, is significantly correlated with three of the independent variables at alpha = 0.05 level. NAF is negatively correlated (-0.234) with EXPENSE, positively correlated (0.286)

with INSTITUTION, and positively correlated (0.774) with SIZE. As for the other independent variables, they are not significantly correlated with NAF.

**Table 5: Pearson Correlation Matrix Among the Variables**

| | NAF | INSIDER | DEBT RATIO | GROWTH | EXPENSE | EFFI-CIENCY | INSTI-TUTION | SIZE |
|---|---|---|---|---|---|---|---|---|
| NAF | 1 | -0.073 | -0.081 | 0.112 | -0.234 | 0.095 | 0.286 | 0.774 |
| Sig.prob | | 0.229 | 0.205 | 0.128 | 0.008* | 0.169 | 0.002* | 0.000* |
| INSIDER | -0.073 | 1 | -0.024 | 0.119 | -0.079 | 0.006 | 0.027 | -0.193 |
| Sig.prob | 0.229 | | 0.405 | 0.112 | 0.211 | 0.476 | 0.393 | 0.024* |
| DEBT RATIO | -0.081 | -0.024 | 1 | -0.111 | 0.286 | -0.180 | -0.320 | 0.016 |
| Sig.prob | 0.205 | 0.405 | | 0.129 | 0.002* | 0.033* | 0.375 | 0.436 |
| GROWTH | 0.112 | 0.119 | -0.111 | 1 | -0.339 | 0.076 | 0.037 | 0.120 |
| Sig.prob | 0.128 | 0.112 | 0.129 | | 0.000* | 0.220 | 0.355 | 0.112 |
| EXPENSE | -0.234 | -0.079 | 0.286 | -0.339 | 1 | 0.002 | -0.066 | -0.245 |
| Sig.prob | 0.008* | 0.211 | 0.002* | 0.000* | | 0.490 | 0.251 | 0.006* |
| EFFI CIENCY | 0.095 | 0.006 | -0.180 | 0.076 | 0.002 | 1 | -0.050 | 0.049 |
| Sig.prob | 0.169 | 0.476 | 0.033* | 0.220 | 0.490 | | 0.308 | 0.309 |
| INSTI-TUTION | 0.286 | 0.027 | -0.032 | 0.037 | -0.066 | -0.050 | 1 | 0.201 |
| Sig.prob | 0.002* | 0.393 | 0.375 | 0.355 | 0.251 | 0.308 | | 0.020* |
| SIZE | 0.774 | -0.193 | 0.016 | 0.120 | -0.245 | 0.049 | 0.201 | 1 |
| Sig.prob | 0.000* | 0.024* | 0.436 | 0.112 | 0.006* | 0.309 | 0.020* | |

*Significant at alpha = 0.05

INSIDER is negatively correlated (-0.193) with SIZE, with a significant value of 0.024. DEBTRATIO is positively correlated (0.286) with EXPENSE and negatively correlated (-0.18) with EFFICIENCY. Both correlations are significant at the respective alpha = 0.01 and alpha = 0.05 level. GROWTH is negatively correlated (-0.339) with EXPENSE at alpha = 0.01 level. Similarly,

SIZE is also found to be negatively correlated (-0.245) with EXPENSE. Finally, INSTITUTION is positively correlated (0.201) with SIZE at alpha = 0.05 level.

Among the independent variables, the highest correlation is between GROWTH and EXPENSE. The degree of collinearity for the two variables is –0.339. This means when GROWTH moves or changes, EXPENSE changes inversely by approximately 34%. However, when a subsidiary auxiliary regression is executed for GROWTH against the rest of the independent variables and EXPENSE against the rest of the explanators, their degrees of collinearity as measured by the coefficient of determinations ($R^2$) are only 11.5% (F-statistic = 13.38) and 22.3% (F-statistics = 9.68) respectively. The SPSS outputs of the subsidiary auxiliary regression performed are provided in Appendix 5.

According to Gujarati (1991), 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 in the next section will be compared to the $R^2$ obtained from the auxiliary regression to assess the multicollinearity problem posed by the GROWTH and EXPENSE variables.

### 4.3 Results of multiple regression analysis

Table 6 provides the results of multiple regression analysis of NAF against the independent variables using the enter procedure method, where the regression equation is built up one variable at a time (Myers and Well, 1991). On the first

step, the predictor that has the highest correlation is selected and if it meets the criterion, a second predictor is selected and tested to determine whether it should be entered into the equation. The predictor selected is the one that would result in the greatest increment in $R^2$ if added into the equation.

**Table 6: Multiple regression analysis of NAF and determining variables using the enter procedure method[9]**

Dependent Variable is NAF
Sample size: 105
Included observations: 105

| 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-statistic | | 23.697 | |
| Mean square residual | 28.671 | | Prob (F-statistic) | | 0.000 | |
| Durbin-Watson stat | 1.100 | | | | | |

* Significant at alpha = 0.05 level

The results show that the independent variables in the model could explain 60.4% of the variation in NAF with an F-value of 23.697 and a probability of 0.000. This means the overall significance of the estimated regression is

[9] A complete SPSS output of the enter procedure method is provided in Appendix 6.

significantly different from zero implying that collectively; the determining variables have a significant impact on NAF. Furthermore, when compared to the $R^2$ produced in the subsidiary auxiliary regression of GROWTH and EXPENSE variables in the previous section (11.5% and 22.3%), the overall $R^2$ of 60.4% is substantially greater and therefore the collinearity between GROWTH and EXPENSE should not be a problem to the whole model (Gujarati, 1991).

When each determining variable is examined individually while holding the remaining predictors constant, it shows that INSTITUTION and SIZE are statistically significant at alpha = 0.05 level to explain the variation in NAF, while the other independent variables are not statistically significant in explaining the variation in NAF.

In addition to the enter procedure method, a stepwise regression is also conducted. Table 7 shows the results of a stepwise regression analysis of NAF against the independent variables[10]. Stepwise regression is a combination of the forward selection and backward elimination procedures (Myers and Well, 1991). The difference between stepwise and enter procedure method is that in stepwise procedure, after each new predictor has been added to the regression equation, all the predictors already in the equation are reexamined to determine whether they should be removed. A partial F test is performed on the predictor already in the equation that produces the smallest increment in $R^2$. If the

[10] The detailed output for the results of stepwise regression analysis is in Appendix 7.

predictor no longer satisfies the criteria for inclusion, it is removed from the equation.

**Table 7: Stepwise regression analysis of NAF and determining variables**

Dependent Variable is NAF
Sample size: 105
Included observations: 105

| 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-statistic | | 81.852 | |
| Mean square residual | 28.366 | | Prob (F-statistic) | | 0.000* | |
| Durbin-Watson stat | 1.06 | | | | | |

* Significant at alpha = 0.05 level

The results indicate that 60.9% of the variance in NAF is accounted for by the regression on SIZE and INSTITUTION, with an F-value of 81.852 and a probability of 0.000. The higher adjusted $R^2$ and F-value imply 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 one unit (in this case, one natural log or ln) increase in SIZE, there will be an increase in the number of analysts 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 to follow larger companies than smaller companies. The positive relationship between NAF and SIZE is also in line with Doukas et al. (2001), Chung et al. (2002) and Chan and Chen (2002), which generally stressed that agency costs are more prominent in larger companies; therefore, more analysts should be following these companies.

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 stock by 5. The positive relationship between INSTITUTION and NAF is parallel to the work of Moyer et al. (1989), where institutional ownership in a company is found to be positively related to the number of analysts following the company. In their study, Moyer et al. (1989) argued that as monitoring agents, security analysts should be interested to follow companies with greater potential agency costs, that are companies having higher institutional ownership. It appears that for Malaysian security analysts, higher institutional ownership does not signal lower potential agency costs in a company and that security analysts tend to follow stocks with higher institutional ownership percentage.

Looking back at Table 5, 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 addition to 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 scrutinize the stocks listed on the KLSE. 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, DEBTRATIO, EXPENSE and EFFICIENCY) are not statistically significant and these are generally in contrast to the previous empirical studies. INSIDER variable is found to be negatively and significantly related to NAF in Moyer et al. (1989). Similarly, the work Doukas et al. (2001) concluded that insider ownership variable is negatively related to the number of analyst following. Based on the findings of this dissertation, the number of analysts following in Malaysia does not have any significant relationship with the proportion of insider ownership.

The number of analysts following can be high for stocks with low or high insider ownership. For example, both Road Builder (M) Holdings Berhad and Tanjong PLC have 24 analysts following the stocks, but the insider ownership percentage for the companies are 15.72% and 0.02%, respectively. In another instance, Asas Dunia Berhad and Bumi Armada Berhad have only one analyst following the stocks, and the insider ownership percentage for the companies are 0.06% and 15.37%, respectively.

Based on the results in Table 6, GROWTH coefficient not only produced unexpected sign (-0.637), but it is 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 (as proxied by assets growth) is positively and significantly related to the number of analysts following the stock. In Cruthcley and Jensen (1999), growth of company, which is measured by sales growth, is found to be positively and significantly related with agency costs in a company. In this dissertation, it can be implied that the number of analysts following a stock does not have any significant relationship with the company's growth. Similarly, with respect to the agency costs theory, company's growth in Malaysia probably does not signify potential agency costs in a company.

Based on the results in Table 6, the coefficient of DEBTRATIO variable produced the expected sign (-0.224), but the t-statistic of –1.128 resulted in the probability level of 0.262, therefore it fails to reject the null hypothesis of $\beta = 0$. The study by Moyer et al. (1989) has proven that financial leverage or debt ratio is negatively and significantly related to the number of analysts following. Therefore, that study supported the proposition by Jensen and Meckling (1976) that a high debt level can reduce agency costs. Similarly, the studies of Crutchley and Jensen (1999), and Doukas et al. (2001) also proved that debt ratio is negatively and significantly related to agency costs in a company. In this dissertation, the number of analysts following a company does not have any significant relationship with the company's debt level, as far as the Malaysian

analysts and companies are concerned. Companies that have high number of analysts following can be highly levered or unlevered at all.

The results on both EXPENSE and EFFICIENCY variables in this study are in contrast to the results by Ang et al. (2000), where expense ratio is found to be positively related to agency costs, while efficiency ratio is found to be negatively related to agency costs. The findings in Ang et al. (2000) are statistically significant at alpha = 0.05 level. Based on Table 5, 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 companies in the sample is not related to the level of expense and efficiency ratios of the companies. It means that security analysts in Malaysia do not consider the level of expense or efficiency ratios in selecting the stocks to be analyzed.

## 4.4 Summary of the chapter

This chapter provides the overall findings of this study. Section 4.1 discusses the descriptive statistics of all eight variables contained in the model presented in Chapter 3. Among the notable findings in this section is that for the companies in the sample, the average institutional ownership is much higher than the average insider ownership by 4.3 times. In addition, the average total sales for the firms in the sample is 1.73 times greater than the average market capitalization. Section 4.2 proceeds with a discussion on the correlations among the variables in the model. Using Pearson Correlation, the dependent variable NAF is significantly correlated with three of the independent variables

at alpha = 0.05 level. NAF is negatively correlated with EXPENSE and positively correlated with INSTITUTION and SIZE. As for the other independent variables, they are not significantly correlated with NAF. A relatively high correlation is recorded between two of the determining variables in the model, GROWTH and EXPENSE (-0.339). However, a subsidiary auxiliary regression performed for GROWTH against the rest of the independent variables and EXPENSE against the rest of the explanatory variables produced $R^2$ figures that are relatively smaller than the overall $R^2$ of the model.

Section 4.3 discusses the results of multiple regression analysis performed on the variables selected in this study. When the enter procedure method is used, the results show that the independent variables in the model could explain 60.4% of the variation in NAF with an F-value of 23.697 and a probability of 0.000. Among the independent variables, only INSTITUTION and SIZE are statistically significant at alpha = 0.05 level to explain the variation in NAF, while the other independent variables are not statistically significant. Next, when a stepwise regression is conducted, the results indicate that the adjusted $R^2$ improves to 60.9% (F-value of 81.852 and a probability of 0.000), and INSTITUTION and SIZE once again become the significant explanatory variables.

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 of the other independent variables in the study (INSIDER, GROWTH, DEBTRATIO, EXPENSE and EFFICIENCY) are not statistically significant.

# CHAPTER FIVE

## CONCLUSION

This chapter provides the overall conclusion of this dissertation and it will be divided into four sections. Section 5.1contains the restatement of objective, section 5.2 discusses the summary of the findings of the study, section 5.3 presents the implications of the study, and section 5.4 provides the directions for further research.

### 5.1 Restatement of Objective

The objective of this study is to examine security analyst monitoring activity and its effect in reducing agency costs of companies in the Malaysian setting. Since there has been no study in Malaysia that specifically looks into the monitoring role of the security analysts and agency costs in companies, this study is expected to contribute to the body of knowledge because it has covered the gap in the previous literatures. The findings of this study is also vital to investors, particularly large institutional investors because it will testify further on the level of efficiency of the Malaysian stock market, as far as the agency problem is concerned.

## 5.2 Summary of the Findings

By using 105 companies from ten industries listed on the Main Board and Second Board of the KLSE 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's size (SIZE) are found to have a significant effect in explaining the variation of analysts following in an emerging market such as Malaysia. These variables could explain 60.4 percent of the variation in NAF with an F-statistic of 23.697 and a probability of 0.000. When a stepwise regression is executed to take into account of multicollinearity problem, INSTITUTION and SIZE remain to have a significant influence on the variation of NAF with an $R^2$ of 60.9 percent with an F-statistic of 81.852 and a probability of 0.000. The other independent variables are still found to have no significant effect in explaining the variation of NAF.

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 result shows that companies with larger market capitalization (proxy used for SIZE) and higher institutional ownership have larger number of analysts following the companies. This implies that Malaysian security analysts prefer

companies that are larger in size and have larger institutional ownership. Moyer et al. (1989) stressed that when the potential agency costs in a company is great the number of analysts following the stocks is expected to be high, and vice-versa. They explained further that when the potential for, and economic consequences of, agency-related problems in a company is great, analyst research activity should be greater than when potential agency-related costs in a firm are low.

If this argument is used for the result of this study, it can be concluded that companies with larger market capitalization and higher institutional ownership have greater agency costs because those companies have greater number of analyst coverage. Therefore, among the seven determining variables selected to measure agency costs in the companies listed on the KLSE, only SIZE and INSTITUTION are significant. As has been discussed earlier, larger companies are more susceptible to agency conflicts due to the larger number of shareholders and managers in the companies. Malaysian security analysts might take into account this factor in selecting the companies to analyze. As for the institutional ownership, its positive relationship with the number of analyst following may be explained by the fiduciary responsibilities assumed by the institutional investors of a company common stock. By assuming fiduciary responsibilities with respect to their clients through their portfolio management activities, the institutional investors use outside analysts' forecasts to show evidence that they are fulfilling their fiduciary role, although these institutional investors may have their own analysts. This might explain the higher number of analyst coverage for the companies with larger institutional ownership.

Unlike in previous studies, the result of this study shows that insider ownership (INSIDER) and debt ratio (DEBTRATIO) of a company are not significantly related with the number of analysts following the company. Moreover, previous literature also showed that company's growth (GROWTH), expense ratio (EXPENSE) and efficiency ratio (EFFICIENCY) are significantly related with agency costs in companies. The result of this study implies that Malaysian security analysts might not look into account the insider ownership and debt ratio in selecting the companies to be analyzed. Also, these two variables are not significant in explaining the agency costs in companies listed on the KLSE.

Therefore, 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 companies is partially supported in the Malaysian setting, with institutional ownership and company's size being the significant explanatory factors.

## 5.3 Implications of the Study

This research has examined security analyst monitoring activity and its effect in reducing agency costs of companies in the Malaysian setting. The findings have verified and rejected earlier hypotheses made in previous researches. The findings concluded that institutional ownership and size of companies are the factors that can significantly explain Malaysian security analysts monitoring activity in reducing the agency costs in companies. Therefore, to a certain extent, Malaysian security analysts play the monitoring role in reducing the

agency costs in companies listed on the KLSE. This may send a positive signal to investors, especially the foreign institutions because they rely quite heavily on the analysts' forecasts of companies.

## 5.4 Direction for further studies

This dissertation concentrates on the monitoring activity of Malaysian security analysts with regards to reducing agency costs in companies. The possible number of variables used to directly or indirectly measure the agency costs is abundant, but due to technical constraints, this research focuses on the major variables that are repeatedly used by several researchers. There might be other variables that can explain the variation in the number of analysts following a company. Other determining variables that measure dividend, investment opportunity and diversification may be included to better understand the variation of analysts following and also agency costs in companies listed on the KLSE. In addition, instead of using only a single time-horizon for the analysts following, future research may use multiple time-horizons to take into account the consistency of companies coverage for the whole year period.

## LIST OF REFERENCES


Allen, A., Cho, J.Y., & Jung, K. (1997). Earnings forecast errors: Comparative evidence from the Pacific-Basin capital markets. *Pacific-Basin Finance Journal.* 5, 115-129.

Ang, J.S., Cole, R.A., & Lin, J.W. (2000). Agency Costs and Ownership Structure. *Journal of Finance.* LV(1), 81-106.

Ariff, M., Shamser, M., & Annuar, M.N. (1998). *Stock Pricing in Malaysia: Corporate Financial & Investment Management.* UPM Press, Serdang.

Armstrong, J.S. (1983). Relative Accuracy of Judgmental and Extrapolative Methods in Forecasting Annual Earnings. *Journal of Forecasting.* 2 (Oct.-Dec.), 437-447.

Becker, C.L., Defond, M.L., Jiambalvo, J., & Subramanyam, K.R. (1988). The effect of audit quality on earnings management. *Contemporary Accounting Research.* 15, 1-24.

Bacharach, S.B. (1989). Organizational theories: Some criteria for evaluation. *Academy of Management Review.* 14 (14), 496-515.

Bhushan, R. (1989). Firm characteristics and analyst following. *Journal of Accounting and Economics.* 37, 39-65.

Brennan, M., & Hughes, P. (1991). Stock prices and the supply of information. *Journal of Finance.* 46, 1665-1691.

Brous, P.A., & Kini, O. (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., & Rozef, M.S. (1978). The superiority of analysts' forecasts as measures of expectations: evidence from earnings. *Journal of Finance.* 33 (March), 1-16.

Chen, C.R., Chan, K. C., & Steiner, T.L. (2002). Are all security analysts equal? *Journal of Financial Research.* 25 (3), 415-430.

Chung, K.H. (2000). Marketing of stocks by brokerage firms: The role of financial analysts. *Financial Management.*

Chung, R., Firth, M., & Kim, J.B. (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., & Hopwood, W. (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 (Autumn), 349-406.

Crutchley, C.E., & Jensen, M.R.H. (1999). Agency problems and the simultaneity of financial decision making. *International Review of Financial Analysis*. 8 (2), 177-198.

DeFond, M.L., & Park, C.W. (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., Kim, C.F., & Pantzalis, C. (2000). Security analysis, agency costs and firm characteristics. *Financial Analysts Journal*. 56(6), 54-63.

Elton, E.J., Gruber M., & Gultekin, M. (1981). Expectations and share prices. *Management Science*. 27 (Sep), 975-987.

Fama, E.F., & Jensen, M.C. (1983). Separation of ownership and control. *Journal of Law and Economics*. 26, 301-325.

Fried, D., & Givoly, D. (1982). Financial analysts forecasts of earnings: A better surrogate for earnings expectations. *Journal of Accounting and Economics*. 4 (Oct), 85-107.

Givoly, D., & Lakonishok, J. (1984). The informational content of financial analysts' forecasts of earnings. *Journal of Accounting and Economics*. 1 (Winter), 165-185.

Guba, E.G., & Lincoln, Y.S. (1994). Competing paradigms in qualitative research. *Handbook of Qualitative Research*. Eds N.K. Denzin & Y.S. Lincoln. Sage, Thousand Oaks, 105-117.

Gujarati, D.N. (1992). *Essentials of Econometrics*. New York: Mc Graw-Hill, Inc.

Haitovsky, Y. (1969). A note on the maximization of $R^2$. *American Statistician*. 21, 20-21.

Huson, M.R., Parrino, R., & Starks, L.T. (2001). Internal mechanisms and CEO turnover: A long-term perspective. *Journal of Finance*. LVI (6), 2265-2297.

Jensen, M. (1983). Organizational theory and methodology. *The Accounting Review*. 58 (Apr), 319-339.

Jensen, M.C. (1988). Takeovers, their causes and consequences. *Journal of Economic Perspectives*. 2 (Winter), 21-48.

Jensen, M.C., & Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics*. 3 (Oct.), 305-360.

John, K. (1987). Risk-shifting incentives and signaling through corporate capital structure. *Journal of Finance*. 42 (July), 623-644.

Kalay, A. (1982). Stockholder-bondholder conflict and dividend constraints. *Journal of Financial Economics*. 10 (July), 211-233.

Kim, W.S., & Sorenson, E.H. (1986). Evidence on the impact of the agency costs of debt on corporate debt policy. *Journal of Financial and Quantitative Analysis*. 21, 131-144.

Levin, R.I., & Rubin, D.S. (1994). *Statistics for Management*. Prentice Hall, New Jersey, USA.

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.

Maddala, G.S. (1988). *Introduction to Econometrics*. Macmillan Publishing Company, New York, USA.

Madura, J. (2001). *Financial Markets and Institutions*. South-Western College Publishing, USA.

McConnel, J.J., & Servaes, H. (1990). Additional evidence on equity ownership and corporate value. *Journal of Financial Economics*. 27, 595-612.

Monks, R., & Minow, N. (1995). *Corporate Governance*. Blackwell, Cambridge, MA.

Morck, R., Shleifer, A., & Vishny, R.W. (1988). Management ownership and market valuation: An empirical analysis. *Journal of Financial Economics*. 20, 293-315.

Moyer, R.C., Chatfield, R.E., & Sisneros, P.M. (1989). Security analyst monitoring activity: Agency costs and Information demands. *Journal of Financial and Quantitative Analysis*. 24 (4), 503-512.

Myers, J.L., & Well, A.D. (1991). *Research Design and Statistical Analysis*. Harper Collins Publishers, New York.

Myers, S.C. (2000). Outside equity. *Journal of Finance*. IV (3), 1005-1037.

Peterson, D., & Peterson, P. (1982). The effect of changing expectations upon stock returns. *Journal of Financial and Quantitative Analysis*. 17 (Dec), 799-813.

Pozen, R.C. (1994). Institutional investors: The reluctant activists. *Harvard Business Review*. 72, 140-149.

Rao, P. (1976). On a correspondence between t and F values in multiple regression. *American Statistician*. 30, 190-191.

Reilly, F.K. (1994). *Investment Analysis and Portfolio Management*. The Dryden Press, Hartcourt Brace College Publishers, Florida, USA.

Rozeff, M.S. (1983). Predicting long-term earnings growth: comparisons of expected return models, submartingles and value line analysts. *Journal of Forecasting*. 2 (Oct/Dec), 425-453.

Schooley, D., & Barney, L.D. (1994). Using dividend policy and managerial ownership to reduce agency costs. *Journal of Financial Research*. 17, 363-373.

Shleifer, A., & Vishny, R.W. (1986). Large shareholders and corporate control. *Journal of Political Economy*. 94, 461-488.

Stanley, K.L., Lewellen, W.G., & Schlarbaum, G.G. (1984). Further evidence of the value of professional investment research. *Journal of Financial Research*. 4 (Spring), 1-9.

Timme, S.G., & 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, Nov.

Vander Weide, J.H., & Carleton, W.T. (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.

Wansley, J.W., Collins, M.C., & Dutta, A.S. (1996). Further evidence on the relation between corporate ownership structure and debt policy. *Working paper*, University of Tennessee at Knoxville.

Williams, J. (1987). Perquisites, Risk, and Capital Structure. *Journal of Finance*. XLII (1), 29-44.

Williams, J.R., Stanga, K.G., Holder, W.W. (1992). *Intermediate Accounting*. The Dryden Press, Harcourt College Publishers.

Womack, K.L. (1996). Do brokerage analysts' recommendations have investment value? *Journal of Finance*. LI (1), 137-167.

Zikmund, W.G. (2000). *Business Reseacrh Methods.* Hartcourt College Publishers, USA.

# APPENDICES

APPENDIX 1: A SAMPLE OF THE EDGE/THOMSON FIRST CALL EARNINGS TABLE AS APPEARED IN THE EDGE

APPENDIX 2: LIST OF STOCKBROKING COMPANIES IN MALAYSIA AS AT THE END OF 2001

| | Company | HQ Location | Number of Branches |
|---|---|---|---|
| 1 | Arab-Malaysian Securities Sdn Bhd | Kuala Lumpur | 1 |
| 2 | Affin-UOB Securities Sdn Bhd | Kuala Lumpur | 0 |
| 3 | Allied Avenue Assets Sec. Sdn Bhd | Kuala Lumpur | 0 |
| 4 | BBMB Securities Sdn Bhd | Kuala Lumpur | 0 |
| 5 | BIMB Securities Sdn Bhd | Kuala Lumpur | 0 |
| 6 | CIMB Securities Sdn Bhd | Kuala Lumpur | 0 |
| 7 | FIMA Securities Sdn Bhd | Kuala Lumpur | 0 |
| 8 | HLG Securities Sdn Bhd | Kuala Lumpur | 0 |
| 9 | Inter-Pacific Securities Sdn Bhd | Kuala Lumpur | 0 |
| 10 | Jupiter Securities Sdn Bhd | Kuala Lumpur | 0 |
| 11 | K & N Kenanga Bhd | Kuala Lumpur | 5 |
| 12 | KAF-Seagroatt & Campbell Sec. S/B | Kuala Lumpur | 0 |
| 13 | KL City Securities Sdn Bhd | Kuala Lumpur | 5 |
| 14 | Leong & Company Sdn Bhd | Kuala Lumpur | 0 |
| 15 | Mayban Securities Sdn Bhd | Kuala Lumpur | 1 |
| 16 | MIDF Sisma Securities Sdn Bhd | Kuala Lumpur | 0 |
| 17 | OSK Securities Sdn Bhd | Kuala Lumpur | 7 |
| 18 | PB Securities Sdn Bhd | Kuala Lumpur | 0 |
| 19 | PM Securities Sdn Bhd | Kuala Lumpur | 2 |
| 20 | Rashid Hussain Securities Sdn Bhd | Kuala Lumpur | 0 |
| 21 | SimeSecurities Sdn Bhd | Kuala Lumpur | 0 |
| 22 | TA Securities Bhd | Kuala Lumpur | 0 |
| 23 | JF Apex Securities Bhd | Selangor | 1 |
| 24 | Amsteel Securities (M) Sdn Bhd | Selangor | 0 |
| 25 | Mohaiyani Securities Sdn Bhd | Selangor | 0 |
| 26 | SJ Securities Sdn Bhd | Selangor | 0 |
| 27 | Eng Securities Sdn Bhd | Johor | 0 |
| 28 | JB Securities Sdn Bhd | Johor | 0 |
| 29 | Kestrel Securities Sdn Bhd | Johor | 0 |
| 30 | Kota Bharu Securities Sdn Bhd | Kelantan | 0 |
| 31 | Malacca Securities Sdn Bhd | Melaka | 0 |
| 32 | Straits Securities Sdn Bhd | Melaka | 0 |
| 33 | A.A. Anthony & Co. Sdn Bhd | P.Pinang | 0 |
| 34 | Hwang-DBS Securities Bhd | P.Pinang | 7 |
| 35 | Smith Zain Securities Sdn Bhd | P.Pinang | 0 |
| 36 | Soon Theam Securities Sdn Bhd | P.Pinang | 0 |
| 37 | Thong & Kay Hian Securities Sdn Bhd | P.Pinang | 0 |
| 38 | UT Securities Sdn Bhd | P.Pinang | 0 |
| 39 | Mercury Securities Sdn Bhd | P.Pinang | 0 |
| 40 | Botly Securities Sdn Bhd | Perak | 0 |
| 41 | Kin Khoon & Co. Sdn Bhd | Perak | 0 |
| 42 | M & A Securities Sdn Bhd | Perak | 0 |
| 43 | SBB Securities Sdn Bhd | Perak | 0 |

| | | | |
|---|---|---|---|
| 44 | FA Securities Sdn Bhd | Terengganu | 0 |
| 45 | PTB Securities Sdn Bhd | Terengganu | 0 |
| 46 | Borneo Securities Sdn Bhd | Sarawak | 0 |
| 47 | InnoSabah Securities Sdn Bhd | Sabah | 0 |
| 48 | ShareTech Securities Sdn Bhd | Labuan | 0 |

APPENDIX 3: RAW DATA FOR THE RELEVANT VARIABLES OF THE COMPANIES IN THE STUDY

Table 1: Data on number of shares, closing price and market capitalization for the companies in the sample of this study as at the end of 2001

| No | Company | No. of Shares | Closing Price (RM) | Market Cap (RM) |
|---|---|---|---|---|
| 1 | ACP Industries Bhd | 126,138,498 | 2.88 | 363,278,874.24 |
| 2 | AIC Corporation Bhd | 68,432,346 | 4.4 | 301,102,322.40 |
| 3 | Amway (M) Holdings Bhd | 164,385,645 | 5.2 | 854,805,354.00 |
| 4 | Asas Dunia Bhd | 191,595,776 | 0.61 | 114,847,940.93 |
| 5 | Asia File Corporation Bhd | 66,698,200 | 3.3 | 220,104,060.00 |
| 6 | Asiatic Development Bhd | 741,335,000 | 1.14 | 845,121,900.00 |
| 7 | Austral Amalgamated Bhd | 188,275,313 | 0.51 | 96,020,409.63 |
| 8 | Bandar Raya Developments Bhd | 476,378,039 | 1.23 | 585,944,987.97 |
| 9 | Berjaya Sports Toto Bhd | 575,760,522 | 6.35 | 3,656,079,314.70 |
| 10 | British American Tobacco (M) Bhd | 285,530,000 | 37 | 10,564,610,000.00 |
| 11 | Bumi Armada Bhd | 63,000,000 | 5.5 | 346,500,000.00 |
| 12 | Carlsberg Brewery M'sia Bhd | 153,007,000 | 10.8 | 1,652,475,600.00 |
| 13 | Celcom Bhd | 754,907,661 | 2.89 | 2,181,683,140.29 |
| 14 | Cement Ind. Of Malaysia Bhd | 131,920,785 | 3.7 | 488,106,904.50 |
| 15 | Computer Systems Advisers Bhd | 97,562,000 | 4.42 | 431,224,040.00 |
| 16 | Crest Petroleum Bhd | 75,778,200 | 3.84 | 290,988,288.00 |
| 17 | Cycle & Carriage Bintang Bhd | 97,835,500 | 5.2 | 508,744,600.00 |
| 18 | Dialog Group Bhd | 86,747,420 | 4.8 | 416,387,616.00 |
| 19 | Diperdana Holdings Bhd | 35,000,000 | 1.63 | 57,050,000.00 |
| 20 | Eastern Pacific Industrial Corp. bHD | 80,650,000 | 2.12 | 170,978,000.00 |
| 21 | Edaran Otomobil Nasional Bhd | 228,542,823 | 9 | 2,056,885,407.00 |
| 22 | ENG Teknologi Holdings Bhd | 80,108,038 | 3.24 | 259,550,043.12 |
| 23 | Fraser & Neave Hldg Bhd | 356,493,101 | 3.58 | 1,276,245,301.58 |
| 24 | Gamuda Bhd | 665,928,672 | 4.52 | 3,009,997,597.44 |
| 25 | Genting Bhd | 704,338,954 | 10.5 | 7,395,559,017.00 |
| 26 | Golden Hope Plantations Bhd | 1,024,357,499 | 3.58 | 3,667,199,846.42 |
| 27 | Guthrie Ropel Bhd | 127,036,071 | 3.04 | 386,189,655.84 |
| 28 | Hap Seng Consolidated Bhd | 622,661,000 | 2.3 | 1,432,120,300.00 |
| 29 | Highlands & Lowland Bhd | 604,335,658 | 2.56 | 1,547,099,284.48 |
| 30 | Hong Leong Industries Bhd | 225,128,500 | 5.55 | 1,249,463,175.00 |
| 31 | Hume Industries (M) Bhd | 248,623,630 | 4.1 | 1,019,356,883.00 |
| 32 | IGB Corporation Bhd | 593,989,512 | 1.12 | 665,268,253.44 |
| 33 | IJM Corporation Bhd | 352,709,654 | 4.26 | 1,502,543,126.04 |
| 34 | IOI Corporation Bhd | 854,350,614 | 3.84 | 3,280,706,357.76 |
| 35 | IOI Properties Bhd | 332,667,800 | 4.92 | 1,636,725,576.00 |
| 36 | Jaya Tiasa Holdings Bhd | 282,528,499 | 2.09 | 590,484,562.91 |
| 37 | Johor Port Bhd | 330,000,000 | 1.39 | 458,700,000.00 |
| 38 | JT International Bhd | 261,534,406 | 4.8 | 1,255,365,148.80 |
| 39 | Kedah Cement Holdings Bhd | 419,659,001 | 2.43 | 1,019,771,372.43 |
| 40 | KFC Holdings (M) Bhd | 193,040,670 | 4.42 | 853,239,761.40 |

| No | Company | No. of Shares | Closing Price (RM) | Market Cap (RM) |
|---|---|---|---|---|
| 42 | KL Kepong Bhd | 712,516,128 | 5.3 | 3,776,335,478.40 |
| 43 | Konsortium Logistik Bhd | 181,264,954 | 1.66 | 300,899,823.64 |
| 44 | Kulim (M) Bhd | 189,056,012 | 1.53 | 289,255,698.36 |
| 45 | Kumpulan Guthrie Bhd | 1,000,003,000 | 2.15 | 2,150,006,450.00 |
| 46 | Land&General Bhd | 537,507,530 | 0.305 | 163,939,796.65 |
| 47 | Leader Universal Holdings Bhd | 436,458,652 | 0.52 | 226,958,499.04 |
| 48 | Lingui Development Bhd | 487,610,992 | 1.16 | 565,628,750.72 |
| 49 | Magnum Corporation Bhd | 1,518,986,000 | 2.13 | 3,235,440,180.00 |
| 50 | Malakoff Bhd | 839,271,002 | 3.38 | 2,836,735,986.76 |
| 51 | Malayan Cement Bhd | 2,893,655,156 | 0.985 | 2,850,250,328.66 |
| 52 | Malayawata Steel Bhd | 201,583,701 | 1.17 | 235,852,930.17 |
| 53 | Malaysia Mining Corp Bhd | 83,613,921 | 1.85 | 154,685,753.85 |
| 54 | Malaysian Airline System Bhd | 770,000,000 | 3.5 | 2,695,000,000.00 |
| 55 | Malaysian Oxygen Bhd | 138,412,504 | 10.2 | 1,411,807,540.80 |
| 56 | Malaysian Pacific Industries Bhd | 209,884,420 | 15.7 | 3,295,185,394.00 |
| 57 | Malaysian Resources Corp. Bhd | 976,549,499 | 1.24 | 1,210,921,378.76 |
| 58 | Matsushita Electric Co (M) Bhd | 35,732,812 | 16.2 | 578,871,554.40 |
| 59 | MBM Resources Bhd | 139,000,000 | 3.6 | 500,400,000.00 |
| 60 | Mitrajaya Holdings Bhd | 120,803,800 | 1.26 | 152,212,788.00 |
| 61 | Nanyang Press Holdings Bhd | 61,910,670 | 5.4 | 334,317,618.00 |
| 62 | Nestle (Malaysia) Bhd | 234,500,000 | 20.5 | 4,807,250,000.00 |
| 63 | Oriental Holdings Bhd | 517,000,000 | 3.8 | 1,964,600,000.00 |
| 64 | OYL Industries Bhd | 136,098,945 | 15.9 | 2,163,973,225.50 |
| 65 | Palmco Holdings Bhd | 199,357,120 | 4.48 | 893,119,897.60 |
| 66 | Per. Otomobil Nasional Bhd | 542,716,000 | 8.05 | 4,368,863,800.00 |
| 67 | Petronas Dagangan Bhd | 496,727,000 | 4.22 | 2,096,187,940.00 |
| 68 | Powertek Bhd | 230,000,000 | 5 | 1,150,000,000.00 |
| 69 | PPB Oil Palms Bhd | 421,754,206 | 2.19 | 923,641,711.14 |
| 70 | Puncak Niaga Holdings Bhd | 437,500,000 | 2.57 | 1,124,375,000.00 |
| 71 | Ramatex Bhd | 427,200,000 | 2.33 | 995,376,000.00 |
| 72 | Renong Bhd | 2,323,729,124 | 0.765 | 1,777,652,779.86 |
| 73 | Resorts World Bhd | 1,091,843,334 | 6.15 | 6,714,836,504.10 |
| 74 | Road Builder (M) Holdings Bhd | 325,368,000 | 4.5 | 1,464,156,000.00 |
| 75 | Sapura Telecommunications Bhd | 161,098,968 | 3.08 | 496,184,821.44 |
| 76 | SCB Developments Bhd | 153,235,464 | 4.08 | 625,200,693.12 |
| 77 | Shangri-La Hotels (M) Bhd | 440,000,000 | 1.03 | 453,200,000.00 |
| 78 | Sime Darby Bhd | 2,325,960,074 | 4.9 | 11,397,204,362.60 |
| 79 | Sime UEP Properties Bhd | 404,459,325 | 3.6 | 1,456,053,570.00 |
| 80 | Sistem Televisyen M'sia Bhd | 170,318,012 | 0.53 | 90,268,546.36 |
| 81 | Southern Steel Bhd | 282,353,000 | 0.8 | 225,882,400.00 |
| 82 | SP Setia Bhd | 335,072,373 | 2.7 | 904,695,407.10 |
| 83 | STAR Publications (M) Bhd | 303,855,648 | 4.94 | 1,501,046,901.12 |
| 84 | Sunrise Bhd | 181,293,000 | 1.01 | 183,105,930.00 |
| 85 | Sunway Building Technology Bhd | 126,515,600 | 0.6 | 75,909,360.00 |
| 86 | Sunway City Bhd | 340,199,000 | 1.2 | 408,238,800.00 |
| 87 | Sunway Holdings Incorp. Bhd | 404,985,000 | 0.6 | 242,991,000.00 |
| 89 | Taliworks Corporation Bhd | 117,400,000 | 1.62 | 190,188,000.00 |
| 90 | Tan Chong Motor Holdings Bhd | 672,000,000 | 1.42 | 954,240,000.00 |

| No | Company | No. of Shares | Closing Price (RM) | Market Cap (RM) |
|---|---|---|---|---|
| 92 | Telekom Malaysia Bhd | 3,098,427,380 | 10.3 | 31,913,802,014.00 |
| 93 | Tenaga Nasional Bhd | 3,106,854,300 | 10.7 | 33,243,341,010.00 |
| 94 | The New Straits Times Press Bhd | 216,036,504 | 5 | 1,080,182,520.00 |
| 95 | Time Engineering Bhd | 746,412,417 | 1.61 | 1,201,723,991.37 |
| 96 | Tractors Malaysia Holdings Bhd | 324,000,000 | 2.87 | 929,880,000.00 |
| 97 | Transmile Group Bhd | 93,251,241 | 2.4 | 223,802,978.40 |
| 98 | UMW Holdings Bhd | 270,026,240 | 6.95 | 1,876,682,368.00 |
| 99 | Unza Holdings Bhd | 73,074,068 | 4.22 | 308,372,566.96 |
| 100 | WCT Engineering Bhd | 96,616,800 | 3.62 | 349,752,816.00 |
| 101 | WTK Holdings Bhd | 163,866,527 | 4.02 | 658,743,438.54 |
| 102 | Yeo Hiap Seng Bhd | 128,095,541 | 1.94 | 248,505,349.54 |
| 103 | YTL Cement Bhd | 145,479,640 | 2.48 | 360,789,507.20 |
| 104 | YTL Corporation Bhd | 1,473,305,224 | 4.82 | 7,101,331,179.68 |
| 105 | YTL Power Int'l Bhd | 2,288,666,953 | 2.45 | 5,607,234,034.85 |

Table 2: Data on Total Assets for the companies in the sample of the study in the year 1996 to 2001 (RM million)

| No | Company | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|---|
| 1 | ACP Industries Bhd | 290.9 | 372.8 | 551.0 | 518.2 | 580.7 | 590.5 |
| 2 | AIC Corporation Bhd | 136.3 | 166.4 | 375.9 | 425.6 | 452.4 | 442.7 |
| 3 | Amway (M) Holdings Bhd | 293.8 | 365.1 | 387.8 | 325.5 | 295.6 | 310.5 |
| 4 | Asas Dunia Bhd | 362.7 | 397.2 | 348.5 | 340.6 | 333.1 | 330.8 |
| 5 | Asia File Corporation Bhd | 43.4 | 50.0 | 63.7 | 77.8 | 92.4 | 109.5 |
| 6 | Asiatic Development Bhd | 799.4 | 923.3 | 991.0 | 1,212.6 | 1,201.4 | 1,302.9 |
| 7 | Austral Amalgamated Bhd | 764.5 | 1,467.0 | 1,120.1 | 599.3 | 562.6 | 558.5 |
| 8 | Bandar Raya Developments Bhd | 1,229.8 | 1,619.2 | 1,416.1 | 1,503.0 | 1,493.6 | 1,383.1 |
| 9 | Berjaya Sports Toto Bhd | 1,034.4 | 1,248.6 | 1,431.6 | 1,748.3 | 1,902.2 | 1,984.2 |
| 10 | British American Tobacco (M) Bhd | 1,020.0 | 887.1 | 915.0 | 1,900.4 | 1,898.0 | 1,713.7 |
| 11 | Bumi Armada Bhd | 252.1 | 415.7 | 428.0 | 413.2 | 427.0 | 468.6 |
| 12 | Carlsberg Brewery M'sia Bhd | 489.9 | 581.1 | 626.8 | 602.2 | 629.6 | 670.5 |
| 13 | Celcom Bhd | 4,963.7 | 5,672.4 | 6,096.5 | 5,928.2 | 6,116.4 | 5,674.2 |
| 14 | Cement Ind. Of Malaysia Bhd | 700.3 | 1,002.3 | 960.4 | 721.1 | 1,261.9 | 1,232.2 |
| 15 | Computer Systems Advisers (M) Bhd | 140.1 | 178.6 | 150.4 | 158.7 | 211.9 | 211.9 |
| 16 | Crest Petroleum Bhd | 673.4 | 777.1 | 826.1 | 705.3 | 760.2 | 596.8 |
| 17 | Cycle & Carriage Bintang Bhd | 678.7 | 769.7 | 600.7 | 600.4 | 747.7 | 768.5 |
| 18 | Dialog Group Bhd | 75.7 | 64.9 | 115.5 | 175.2 | 220.2 | 265.8 |
| 19 | Diperdana Holdings Bhd | 127.0 | 138.8 | 151.5 | 173.2 | 205.1 | 221.4 |
| 20 | Eastern Pacific Industrial Corporation Bhd | 230.4 | 232.7 | 230.9 | 241.0 | 256.4 | 268.0 |
| 21 | Edaran Otomobil Nasional Bhd | 8,670.7 | 12,873.6 | 14,207.2 | 15,263.9 | 19,128.3 | 26,326.6 |
| 22 | ENG Teknologi Holdings Bhd | 59.7 | 89.5 | 139.3 | 181.9 | 224.0 | 185.8 |
| 23 | Fraser & Neave Hldg Bhd | 1,190.2 | 1,333.0 | 1,388.3 | 1,285.1 | 1,393.4 | 1,447.5 |
| 24 | Gamuda Bhd | 462.7 | 988.4 | 1,022.2 | 1,161.2 | 1,405.6 | 2,438.2 |
| 25 | Genting Bhd | 6,371.8 | 7,957.4 | 8,340.1 | 9,438.8 | 9,300.8 | 10,221.0 |
| 26 | Golden Hope Plantations Bhd | 3,544.2 | 3,845.1 | 4,419.5 | 4,542.6 | 4,574.9 | 4,495.2 |
| 27 | Guthrie Ropel Bhd | 512.3 | 533.3 | 803.8 | 821.1 | 810.8 | 776.8 |
| 28 | Hap Seng Consolidated Bhd | 849.7 | 1,041.3 | 1,124.0 | 1,188.3 | 1,276.5 | 1,158.7 |
| 29 | Highlands & Lowland Bhd | 1,514.5 | 1,697.3 | 2,288.7 | 2,568.2 | 2,698.2 | 2,806.4 |
| 30 | Hong Leong Industries Bhd | 3,102.0 | 3,813.1 | 4,205.6 | 4,295.0 | 4,589.9 | 4,194.2 |
| 31 | Hume Industries (M) Bhd | 3,692.9 | 4,372.6 | 5,332.4 | 4,891.7 | 4,475.7 | 4,245.9 |
| 32 | IGB Corporation Bhd | 1,317.1 | 1,731.4 | 1,965.5 | 2,244.5 | 2,072.9 | 2,101.9 |
| 33 | IJM Corporation Bhd | 1,448.9 | 1,918.3 | 1,957.9 | 2,020.5 | 2,262.0 | 2,289.9 |
| 34 | IOI Corporation Bhd | 2,500.7 | 3,478.9 | 3,921.6 | 4,067.2 | 4,361.2 | 4,664.7 |
| 35 | IOI Properties Bhd | 911.1 | 1,139.7 | 1,186.5 | 1,196.6 | 1,427.0 | 1,726.4 |
| 36 | Jaya Tiasa Holdings Bhd | 561.7 | 703.2 | 1,239.1 | 1,178.4 | 1,292.7 | 1,139.4 |
| 37 | Johor Port Bhd | 833.0 | 896.1 | 921.2 | 967.3 | 1,011.4 | 1,069.0 |
| 38 | JT International Bhd | 434.4 | 551.6 | 546.5 | 570.0 | 497.9 | 481.8 |
| 39 | Kedah Cement Holdings Bhd | 1,701.0 | 1,796.3 | 1,903.1 | 1,686.2 | 1,590.5 | 1,517.1 |
| 40 | KFC Holdings (M) Bhd | 783.5 | 902.9 | 833.1 | 826.0 | 855.6 | 946.6 |
| 41 | Kian Joo Can Factory Bhd | 562.2 | 619.7 | 704.3 | 667.9 | 723.6 | 723.2 |
| 42 | KL Kepong Bhd | 3,011.2 | 3,293.4 | 3,670.2 | 3,801.9 | 3,751.5 | 3,738.1 |
| 43 | Konsortium Logistik Bhd | 2,561.4 | 3,078.7 | 863.8 | 746.3 | 713.7 | 624.6 |
| 44 | Kulim (M) Bhd | 1,478.2 | 3,930.2 | 3,773.9 | 3,784.3 | 3,588.4 | 3,428.8 |
| 45 | Kumpulan Guthrie Bhd | 2,869.1 | 3,400.9 | 4,374.3 | 4,816.6 | 7,540.6 | 6,490.7 |

| No | Company | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|---|
| 47 | Leader Universal Holdings Bhd | 1,675.4 | 2,614.3 | 2,212.0 | 1,769.0 | 1,537.9 | 1,465.7 |
| 48 | Lingui Development Bhd | 991.5 | 1,037.4 | 870.8 | 930.7 | 970.3 | 1,884.0 |
| 49 | Magnum Corporation Bhd | 2,350.4 | 3,670.5 | 2,658.4 | 2,491.4 | 2,250.2 | 2,353.7 |
| 50 | Malakoff Bhd | 3,698.5 | 4,285.8 | 4,624.8 | 4,876.5 | 1,183.2 | 1,801.1 |
| 51 | Malayan Cement Bhd | 634.5 | 734.9 | 2,743.3 | 4,881.3 | 4,701.6 | 4,608.6 |
| 52 | Malayawata Steel Bhd | 670.7 | 672.0 | 740.7 | 641.0 | 585.0 | 770.2 |
| 53 | Malaysia Mining Corp Bhd | 1,954.8 | 2,661.0 | 2,496.1 | 2,250.8 | 2,146.7 | 2,967.4 |
| 54 | Malaysian Airline System Bhd | 13,304.2 | 14,649.9 | 19,444.9 | 19,505.7 | 18,052.4 | 15,584.3 |
| 55 | Malaysian Oxygen Bhd | 608.4 | 688.6 | 809.5 | 831.9 | 797.2 | 804.9 |
| 56 | Malaysian Pacific Industries Bhd | 1,453.9 | 1,184.5 | 1,515.8 | 1,626.6 | 1,989.7 | 1,832.2 |
| 57 | Malaysian Resources Corp. Bhd | 3,231.5 | 5,244.7 | 5,428.1 | 3,523.9 | 3,500.2 | 2,981.8 |
| 58 | Matsushita Electric Co (M) Bhd | 500.3 | 529.1 | 577.7 | 582.6 | 670.6 | 693.3 |
| 59 | MBM Resources Bhd | 314.8 | 416.1 | 328.9 | 310.4 | 532.7 | 579.0 |
| 60 | Mitrajaya Holdings Bhd | 251.0 | 239.8 | 135.9 | 225.5 | 291.7 | 355.1 |
| 61 | Nanyang Press Holdings Bhd | 363.4 | 356.0 | 348.8 | 374.3 | 329.6 | 245.2 |
| 62 | Nestle (Malaysia) Bhd | 807.6 | 1,123.7 | 1,206.5 | 1,241.0 | 1,202.2 | 1,373.6 |
| 63 | Oriental Holdings Bhd | 2,565.6 | 3,076.6 | 3,064.2 | 3,316.1 | 3,297.1 | 3,068.5 |
| 64 | OYL Industries Bhd | 2,549.1 | 2,501.1 | 3,504.2 | 3,301.4 | 3,061.1 | 2,920.8 |
| 65 | Palmco Holdings Bhd | 573.9 | 609.3 | 650.6 | 552.1 | 493.0 | 643.9 |
| 66 | Per. Otomobil Nasional Bhd | 3,341.8 | 4,653.5 | 5,717.0 | 5,452.2 | 5,480.0 | 6,356.0 |
| 67 | Petronas Dagangan Bhd | 1,526.9 | 1,718.4 | 2,116.6 | 2,417.5 | 2,840.3 | 3,270.1 |
| 68 | Powertek Bhd | 842.8 | 949.4 | 1,040.1 | 1,545.2 | 1,550.3 | 1,918.3 |
| 69 | PPB Oil Palms Bhd | 1,172.2 | 1,254.5 | 1,406.6 | 1,505.1 | 1,239.5 | 1,363.5 |
| 70 | Puncak Niaga Holdings Bhd | 792.0 | 1,346.2 | 2,057.0 | 2,114.5 | 2,520.0 | 2,700.4 |
| 71 | Ramatex Bhd | 635.7 | 1,096.9 | 1,265.7 | 1,440.1 | 1,775.6 | 1,833.4 |
| 72 | Renong Bhd | 9,553.5 | 12,660.9 | 14,014.9 | 12,629.5 | 12,081.8 | 11,537.4 |
| 73 | Resorts World Bhd | 3,565.3 | 4,402.4 | 4,569.3 | 4,998.6 | 5,329.6 | 5,732.7 |
| 74 | Road Builder (M) Holdings Bhd | 504.3 | 895.1 | 967.9 | 1,085.7 | 1,348.4 | 1,639.4 |
| 75 | Sapura Telecommunications Bhd | 769.1 | 846.2 | 939.9 | 624.0 | 145.7 | 160.5 |
| 76 | SCB Developments Bhd | 433.1 | 471.4 | 590.6 | 887.8 | 997.5 | 1,036.1 |
| 77 | Shangri-La Hotels (M) Bhd | 1,131.6 | 1,111.3 | 927.4 | 979.0 | 1,122.2 | 1,306.6 |
| 78 | Sime Darby Bhd | 26,391.6 | 38,216.2 | 12,153.0 | 11,459.1 | 13,724.0 | 13,869.4 |
| 79 | Sime UEP Properties Bhd | 1,185.6 | 1,343.1 | 1,381.1 | 1,297.4 | 1,298.0 | 1,223.4 |
| 80 | Sistem Televisyen M'sia Bhd | 527.1 | 817.5 | 871.6 | 597.4 | 505.5 | 505.5 |
| 81 | Southern Steel Bhd | 1,351.7 | 1,886.4 | 1,852.0 | 1,870.5 | 1,953.5 | 1,782.2 |
| 82 | SP Setia Bhd | 468.3 | 1,139.8 | 1,082.5 | 843.7 | 1,163.6 | 1,151.6 |
| 83 | STAR Publications (M) Bhd | 379.5 | 479.6 | 498.3 | 559.9 | 909.8 | 921.8 |
| 84 | Sunrise Bhd | 257.4 | 444.6 | 482.9 | 556.9 | 624.5 | 600.3 |
| 85 | Sunway Building Technology Bhd | 494.7 | 619.7 | 470.1 | 1,341.0 | 371.1 | 288.2 |
| 86 | Sunway City Bhd | 1,340.7 | 2,060.8 | 1,588.4 | 2,059.8 | 2,076.9 | 2,138.1 |
| 87 | Sunway Holdings Incorp. Bhd | 2,065.9 | 2,503.0 | 2,095.8 | 1,674.5 | 1,882.8 | 1,879.1 |
| 88 | Tai Kwong Yokohama Bhd | 84.3 | 90.0 | 85.2 | 87.3 | 87.7 | 90.8 |
| 89 | Taliworks Corporation Bhd | 40.0 | 39.7 | 26.8 | 24.0 | 164.0 | 178.3 |
| 90 | Tan Chong Motor Holdings Bhd | 2,292.5 | 1,598.0 | 1,019.1 | 938.7 | 917.9 | 993.5 |
| 91 | Tanjong PLC-U | 944.9 | 1,126.9 | 1,373.4 | 2,279.1 | 2,778.8 | 2,927.5 |
| 92 | Telekom Malaysia Bhd | 19,993.2 | 24,205.4 | 25,819.3 | 25,809.6 | 27,266.9 | 27,388.1 |
| 93 | Tenaga Nasional Bhd | 32,488.0 | 38,716.4 | 43,736.2 | 48,782.4 | 51,489.1 | 54,584.8 |
| 94 | The New Straits Times Press (M) Bhd | 1,542.8 | 2,175.6 | 2,515.1 | 2,492.0 | 2,594.4 | 2,454.2 |

| No | Company | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|---|
| 96 | Tractors Malaysia Holdings Bhd | 842.2 | 1,031.9 | 972.1 | 871.5 | 1,015.7 | 1,111.8 |
| 97 | Transmile Group Bhd | 239.2 | 412.2 | 314.1 | 423.5 | 507.8 | 524.5 |
| 98 | UMW Holdings Bhd | 2,452.6 | 2,858.9 | 2,242.8 | 2,483.8 | 2,441.1 | 2,651.7 |
| 99 | Unza Holdings Bhd | 110.1 | 112.3 | 125.4 | 120.7 | 127.9 | 398.1 |
| 100 | WCT Engineering Bhd | 108.3 | 141.2 | 269.2 | 283.2 | 377.7 | 541.4 |
| 101 | WTK Holdings Bhd | 359.3 | 700.7 | 689.5 | 747.8 | 784.1 | 864.9 |
| 102 | Yeo Hiap Seng Bhd | 361.5 | 354.9 | 350.5 | 363.4 | 342.3 | 408.8 |
| 103 | YTL Cement Bhd | 255.3 | 493.2 | 552.1 | 592.8 | 409.5 | 451.3 |
| 104 | YTL Corporation Bhd | 1,979.8 | 8,574.5 | 8,550.3 | 9,457.7 | 9,988.7 | 10,268.0 |
| 105 | YTL Power Int'l Bhd | 4,307.6 | 5,893.1 | 5,206.9 | 5,666.4 | 6,319.8 | 6,366.6 |

Table 3: Data on Total Sales for the companies in the sample of the study in the year 1997 to 2001 (RM million)

| No | Company | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|
| 1 | ACP Industries Bhd | 340.9 | 346.5 | 242.0 | 209.1 | 231.4 |
| 2 | AIC Corporation Bhd | 134.1 | 177.2 | 286.4 | 322.8 | 321.7 |
| 3 | Amway (M) Holdings Bhd | 342.3 | 351.9 | 314.9 | 355.3 | 381.7 |
| 4 | Asas Dunia Bhd | 185.9 | 78.5 | 58.1 | 37.3 | 27.9 |
| 5 | Asia File Corporation Bhd | 47.9 | 60.8 | 64.9 | 74.6 | 80.1 |
| 6 | Asiatic Development Bhd | 313.3 | 351.3 | 446.8 | 230.8 | 199.9 |
| 7 | Austral Amalgamated Bhd | 151.9 | 138.5 | 95.1 | 49.2 | 28.4 |
| 8 | Bandar Raya Developments Bhd | 329.2 | 216.3 | 444.2 | 253.6 | 264.0 |
| 9 | Berjaya Sports Toto Bhd | 1,832.5 | 2,188.2 | 2,176.2 | 2,339.9 | 2,333.3 |
| 10 | British American Tobacco (M) Bhd | 1,963.6 | 1,947.2 | 1,545.2 | 2,772.0 | 3,010.4 |
| 11 | Bumi Armada Bhd | 148.2 | 192.2 | 223.6 | 230.9 | 425.8 |
| 12 | Carlsberg Brewery M'sia Bhd | 755.8 | 777.7 | 842.3 | 852.0 | 841.1 |
| 13 | Celcom Bhd | 2,000.4 | 1,779.8 | 1,701.4 | 2,121.8 | 2,558.8 |
| 14 | Cement Ind Of Malaysia Bhd | 467.4 | 290.9 | 224.7 | 354.6 | 471.2 |
| 15 | Computer Systems Advisers (M) Bhd | 370.0 | 326.5 | 377.9 | 534.8 | 534.8 |
| 16 | Crest Petroleum Bhd | 383.8 | 446.1 | 648.7 | 567.0 | 767.7 |
| 17 | Cycle & Carriage Bintang Bhd | 1,517.7 | 590.7 | 553.1 | 661.1 | 740.8 |
| 18 | Dialog Group Bhd | 123.7 | 144.0 | 311.4 | 316.6 | 321.6 |
| 19 | Diperdana Holdings Bhd | 80.9 | 81.0 | 107.6 | 135.8 | 126.3 |
| 20 | Eastern Pacific Industrial Corporation Bhd | 88.9 | 81.9 | 49.4 | 41.4 | 52.8 |
| 21 | Edaran Otomobil Nasional Bhd | 7,387.4 | 3,603.5 | 5,398.5 | 6,361.5 | 7,548.3 |
| 22 | ENG Teknologi Holdings Bhd | 70.2 | 151.2 | 186.0 | 239.1 | 167.8 |
| 23 | Fraser & Neave Hldg Bhd | 1,148.1 | 1,240.3 | 1,157.2 | 1,366.5 | 1,541.3 |
| 24 | Gamuda Bhd | 792.2 | 681.2 | 510.4 | 637.5 | 831.3 |
| 25 | Genting Bhd | 3,822.0 | 3,369.8 | 3,077.4 | 3,338.6 | 3,148.4 |
| 26 | Golden Hope Plantations Bhd | 1,511.8 | 1,552.8 | 1,946.8 | 1,718.9 | 1,317.4 |
| 27 | Guthrie Ropel Bhd | 131.4 | 157.5 | 152.1 | 95.4 | 104.7 |
| 28 | Hap Seng Consolidated Bhd | 117.3 | 174.6 | 248.9 | 221.5 | 174.8 |
| 29 | Highlands & Lowland Bhd | 370.9 | 458.1 | 544.0 | 418.7 | 464.0 |
| 30 | Hong Leong Industries Bhd | 2,416.2 | 2,440.0 | 1,956.0 | 2,635.2 | 2,510.7 |
| 31 | Hume Industries (M) Bhd | 4,143.4 | 5,399.2 | 5,281.3 | 5,095.9 | 5,266.0 |
| 32 | IGB Corporation Bhd | 647.9 | 461.6 | 131.1 | 312.5 | 199.9 |
| 33 | IJM Corporation Bhd | 1,475.6 | 1,148.5 | 1,210.0 | 615.8 | 857.4 |
| 34 | IOI Corporation Bhd | 851.1 | 935.1 | 1,411.9 | 1,306.7 | 1,291.6 |
| 35 | IOI Properties Bhd | 249.8 | 247.1 | 353.8 | 414.5 | 426.4 |
| 36 | Jaya Tiasa Holdings Bhd | 471.1 | 459.5 | 425.6 | 731.2 | 621.5 |
| 37 | Johor Port Bhd | 213.9 | 201.1 | 231.0 | 260.1 | 260.4 |
| 38 | JT International Bhd | 649.2 | 641.6 | 579.5 | 583.0 | 628.7 |
| 39 | Kedah Cement Holdings Bhd | 561.1 | 622.5 | 341.9 | 598.3 | 647.0 |
| 40 | KFC Holdings (M) Bhd | 860.7 | 840.7 | 879.7 | 997.1 | 1,071.3 |
| 41 | Kian Joo Can Factory Bhd | 438.2 | 425.0 | 425.5 | 493.4 | 494.0 |
| 42 | KL Kepong Bhd | 1,690.9 | 2,334.7 | 2,404.3 | 2,224.1 | 2,041.6 |
| 43 | Konsortium Logistik Bhd | 730.2 | 676.2 | 231.5 | 247.4 | 252.3 |
| 44 | Kulim (M) Bhd | 843.5 | 1,127.6 | 995.3 | 868.2 | 702.6 |

| No | Company | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|
| 46 | Land&General Bhd | 927.1 | 646.4 | 563.5 | 450.4 | 270.7 |
| 47 | Leader Universal Holdings Bhd | 1,432.9 | 1,100.7 | 1,014.0 | 980.4 | 1,137.2 |
| 48 | Lingui Development Bhd | 574.6 | 544.4 | 518.0 | 592.3 | 699.5 |
| 49 | Magnum Corporation Bhd | 3,074.0 | 2,958.2 | 2,917.7 | 2,518.0 | 2,652.6 |
| 50 | Malakoff Bhd | 929.2 | 1,388.5 | 1,572.6 | 166.9 | 4.0 |
| 51 | Malayan Cement Bhd | 921.9 | 6,277.6 | 1,336.6 | 1,576.6 | 1,657.3 |
| 52 | Malayawata Steel Bhd | 514.3 | 432.7 | 245.4 | 394.6 | 453.2 |
| 53 | Malaysia Mining Corp Bhd | 1,392.8 | 1,768.3 | 339.1 | 276.0 | 250.8 |
| 54 | Malaysian Airline System Bhd | 6,485.0 | 7,051.3 | 7,471.9 | 8,160.7 | 8,956.1 |
| 55 | Malaysian Oxygen Bhd | 413.3 | 389.1 | 358.9 | 434.7 | 476.1 |
| 56 | Malaysian Pacific Industries Bhd | 1,034.3 | 980.7 | 1,006.6 | 1,526.6 | 1,332.7 |
| 57 | Malaysian Resources Corp. Bhd | 1,223.6 | 680.4 | 229.0 | 248.6 | 533.1 |
| 58 | Matsushita Electric Co (M) Bhd | 783.3 | 786.4 | 724.4 | 806.6 | 841.9 |
| 59 | MBM Resources Bhd | 860.1 | 283.6 | 455.3 | 537.7 | 612.6 |
| 60 | Mitrajaya Holdings Bhd | 381.7 | 222.9 | 178.9 | 219.6 | 219.1 |
| 61 | Nanyang Press Holdings Bhd | 324.4 | 296.5 | 252.9 | 286.2 | 286.7 |
| 62 | Nestle (Malaysia) Bhd | 2,014.4 | 1,981.2 | 1,952.6 | 2,202.5 | 2,585.7 |
| 63 | Oriental Holdings Bhd | 496.1 | 182.1 | 203.7 | 2,832.7 | 2,583.0 |
| 64 | OYL Industries Bhd | 3,145.6 | 4,433.4 | 4,439.3 | 4,334.4 | 4,565.6 |
| 65 | Palmco Holdings Bhd | 473.0 | 645.4 | 838.5 | 882.8 | 793.0 |
| 66 | Per. Otomobil Nasional Bhd | 6,222.2 | 6,788.5 | 4,075.0 | 6,496.7 | 8,301.2 |
| 67 | Petronas Dagangan Bhd | 3,898.3 | 4,306.1 | 4,002.5 | 5,056.6 | 6,387.8 |
| 68 | Powertek Bhd | 220.4 | 204.4 | 317.3 | 530.5 | 543.4 |
| 69 | PPB Oil Palms Bhd | 1,418.2 | 2,301.6 | 1,814.9 | 1,249.3 | 239.4 |
| 70 | Puncak Niaga Holdings Bhd | 143.1 | 183.4 | 347.5 | 350.6 | 552.3 |
| 71 | Ramatex Bhd | 441.1 | 547.4 | 749.7 | 737.6 | 711.2 |
| 72 | Renong Bhd | 910.1 | 914.9 | 757.1 | 499.8 | 339.5 |
| 73 | Resorts World Bhd | 3,038.7 | 2,178.5 | 2,514.9 | 2,337.9 | 2,503.1 |
| 74 | Road Builder (M) Holdings Bhd | 560.7 | 478.9 | 449.3 | 362.8 | 386.8 |
| 75 | Sapura Telecommunications Bhd | 349.8 | 370.1 | 317.5 | 70.4 | 87.7 |
| 76 | SCB Developments Bhd | 90.5 | 124.0 | 214.7 | 215.4 | 303.7 |
| 77 | Shangri-La Hotels (M) Bhd | 257.7 | 238.6 | 232.6 | 262.1 | 217.1 |
| 78 | Sime Darby Bhd | 13,236.0 | 12,075.8 | 9,910.5 | 10,971.5 | 11,959.9 |
| 79 | Sime UEP Properties Bhd | 506.1 | 316.1 | 140.3 | 258.4 | 282.1 |
| 80 | Sistem Televisyen M'sia Bhd | 279.9 | 249.6 | 211.0 | 221.6 | 240.7 |
| 81 | Southern Steel Bhd | 1,178.5 | 844.5 | 881.2 | 1,254.4 | 1,373.9 |
| 82 | SP Setia Bhd | 399.1 | 340.8 | 518.7 | 542.0 | 555.2 |
| 83 | STAR Publications (M) Bhd | 339.2 | 266.2 | 327.5 | 444.8 | 468.9 |
| 84 | Sunrise Bhd | 96.3 | 135.7 | 141.0 | 153.7 | 102.4 |
| 85 | Sunway Building Technology Bhd | 467.3 | 189.5 | 102.1 | 114.0 | 135.5 |
| 86 | Sunway City Bhd | 304.6 | 410.1 | 479.6 | 480.3 | 588.0 |
| 87 | Sunway Holdings Incorp. Bhd | 1,389.3 | 761.5 | 799.9 | 876.9 | 998.7 |
| 88 | Tai Kwong Yokohama Bhd | 86.3 | 62.1 | 72.4 | 76.0 | 70.7 |
| 89 | Taliworks Corporation Bhd | 24.7 | 29.8 | 18.6 | 117.0 | 117.5 |
| 90 | Tan Chong Motor Holdings Bhd | 2,561.9 | 483.2 | 852.6 | 1,183.6 | 1,500.6 |
| 91 | Tanjong PLC-U | 1,517.8 | 1,671.3 | 1,667.3 | 1,917.5 | 2,116.1 |
| 92 | Telekom Malaysia Bhd | 7,165.7 | 7,980.1 | 7,833.0 | 8,815.7 | 9,673.2 |
| 95 | Time Engineering Bhd | 724.9 | 1,067.4 | 1,028.9 | 1,029.8 | 429.3 |

| No | Company | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|
| 97 | Transmile Group Bhd | 172.3 | 162.9 | 111.1 | 172.1 | 180.7 |
| 98 | UMW Holdings Bhd | 4,101.0 | 1,699.7 | 2,500.5 | 3,136.1 | 3,341.0 |
| 99 | Unza Holdings Bhd | 121.3 | 130.7 | 129.0 | 146.3 | 312.4 |
| 100 | WCT Engineering Bhd | 241.8 | 417.3 | 410.1 | 328.6 | 450.1 |
| 101 | WTK Holdings Bhd | 700.0 | 545.2 | 550.4 | 547.4 | 451.9 |
| 102 | Yeo Hiap Seng Bhd | 493.3 | 484.6 | 481.3 | 446.4 | 464.5 |
| 103 | YTL Cement Bhd | 312.8 | 289.1 | 177.2 | 243.6 | 379.4 |
| 104 | YTL Corporation Bhd | 1,947.3 | 2,136.6 | 1,897.3 | 2,109.7 | 2,326.0 |
| 105 | YTL Power Int'l Bhd | 1,173.4 | 1,272.4 | 1,257.9 | 1,231.9 | 1,319.5 |

Table 4: Data on Operating Expenses for the companies in the sample of the study in the year 1997 to 2001 (RM million)

| No | Company | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|
| 1 | ACP Industries Bhd | 286.7 | 303.4 | 207.4 | 171.2 | 198.4 |
| 2 | AIC Corporation Bhd | 117.2 | 165.6 | 253.5 | 269.2 | 311.3 |
| 3 | Amway (M) Holdings Bhd | 233.7 | 249.3 | 255.6 | 295.5 | 316.4 |
| 4 | Asas Dunia Bhd | 136.0 | 95.3 | 46.0 | 34.8 | 39.9 |
| 5 | Asia File Corporation Bhd | 35.5 | 46.6 | 45.5 | 53.7 | 57.6 |
| 6 | Asiatic Development Bhd | 210.9 | 186.3 | 173.6 | 161.1 | 113.9 |
| 7 | Austral Amalgamated Bhd | 130.2 | 327.7 | 292.1 | 81.9 | 47.4 |
| 8 | Bandar Raya Developments Bhd | 240.5 | 198.6 | 295.9 | 191.8 | 268.8 |
| 9 | Berjaya Sports Toto Bhd | 1,489.0 | 1,734.3 | 1,735.9 | 1,940.5 | 1,930.8 |
| 10 | British American Tobacco (M) Bhd | 1,310.1 | 1,330.3 | 1,131.7 | 2,015.4 | 2,116.6 |
| 11 | Bumi Armada Bhd | 185.2 | 165.3 | 178.9 | 160.0 | 350.4 |
| 12 | Carlsberg Brewery M'sia Bhd | 595.7 | 626.5 | 705.2 | 700.3 | 681.2 |
| 13 | Celcom Bhd | 1,596.2 | 1,757.1 | 1,674.2 | 1,821.3 | 2,220.6 |
| 14 | Cement Ind. Of Malaysia Bhd | 371.6 | 255.3 | 221.5 | 316.9 | 410.2 |
| 15 | Computer Systems Advisers (M) Bhd | 350.7 | 309.9 | 357.4 | 496.3 | 496.4 |
| 16 | Crest Petroleum Bhd | 420.4 | 330.4 | 6,423.7 | 552.1 | 726.0 |
| 17 | Cycle & Carriage Bintang Bhd | 1,350.7 | 603.3 | 517.2 | 580.3 | 652.6 |
| 18 | Dialog Group Bhd | 117.1 | 131.8 | 274.5 | 266.8 | 278.0 |
| 19 | Diperdana Holdings Bhd | 71.4 | 73.7 | 92.3 | 108.3 | 105.3 |
| 20 | Eastern Pacific Industrial Corporation Bhd | 71.6 | 55.0 | 22.2 | 24.3 | 28.3 |
| 21 | Edaran Otomobil Nasional Bhd | 6,717.8 | 3,501.9 | 4,778.0 | 5,586.3 | 6,728.0 |
| 22 | ENG Teknologi Holdings Bhd | 57.8 | 118.7 | 152.4 | 198.2 | 151.4 |
| 23 | Fraser & Neave Hldg Bhd | 1,049.5 | 1,228.4 | 1,208.3 | 1,289.7 | 1,431.6 |
| 24 | Gamuda Bhd | 713.3 | 620.9 | 441.2 | 516.1 | 686.4 |
| 25 | Genting Bhd | 2,279.5 | 2,460.1 | 1,556.0 | 3,661.3 | 2,113.8 |
| 26 | Golden Hope Plantations Bhd | 1,171.3 | 1,306.0 | 1,564.6 | 1,524.3 | 1,301.6 |
| 27 | Guthrie Ropel Bhd | 79.6 | 78.9 | 90.5 | 80.2 | 111.9 |
| 28 | Hap Seng Consolidated Bhd | 59.6 | 110.5 | 153.5 | 151.8 | 126.2 |
| 29 | Highlands & Lowland Bhd | 227.0 | 257.2 | 285.9 | 255.1 | 302.1 |
| 30 | Hong Leong Industries Bhd | 2,150.9 | 2,260.8 | 1,925.0 | 2,206.2 | 2,379.1 |
| 31 | Hume Industries (M) Bhd | 3,902.4 | 5,252.1 | 5,136.1 | 4,783.6 | 4,869.7 |
| 32 | IGB Corporation Bhd | 626.6 | 466.6 | 135.0 | 273.6 | 177.2 |
| 33 | IJM Corporation Bhd | 1,394.8 | 1,071.1 | 1,142.6 | 527.1 | 729.8 |
| 34 | IOI Corporation Bhd | 573.0 | 624.4 | 980.5 | 806.8 | 846.7 |
| 35 | IOI Properties Bhd | 130.8 | 145.8 | 210.6 | 213.0 | 227.3 |
| 36 | Jaya Tiasa Holdings Bhd | 308.0 | 365.1 | 480.3 | 594.6 | 617.6 |
| 37 | Johor Port Bhd | 148.6 | 155.5 | 166.4 | 176.4 | 175.5 |
| 38 | JT International Bhd | 515.2 | 540.0 | 445.0 | 506.0 | 552.8 |
| 39 | Kedah Cement Holdings Bhd | 448.4 | 566.6 | 473.7 | 528.8 | 554.2 |
| 40 | KFC Holdings (M) Bhd | 766.4 | 827.9 | 833.8 | 891.0 | 966.5 |
| 41 | Kian Joo Can Factory Bhd | 360.3 | 351.1 | 376.4 | 455.3 | 446.5 |
| 42 | KL Kepong Bhd | 1,419.6 | 1,972.6 | 2,007.9 | 1,982.5 | 1,854.5 |
| 43 | Konsortium Logistik Bhd | 636.6 | 636.0 | 188.0 | 219.0 | 229.4 |
| 44 | Kulim (M) Bhd | 643.4 | 986.6 | 785.0 | 802.3 | 644.6 |
| 45 | Kumpulan Guthrie Bhd | 1,413.8 | 1,279.6 | 1,205.0 | 1,353.2 | 1,847.8 |

| No | Company | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|
| 47 | Leader Universal Holdings Bhd | 1,499.7 | 1,352.6 | 1,424.3 | 905.7 | 1,073.6 |
| 48 | Lingui Development Bhd | 423.5 | 466.9 | 423.1 | 437.4 | 642.7 |
| 49 | Magnum Corporation Bhd | 2,526.4 | 2,733.6 | 2,390.7 | 2,109.9 | 2,398.2 |
| 50 | Malakoff Bhd | 742.1 | 1,004.7 | 1,045.0 | 2.6 | 24.7 |
| 51 | Malayan Cement Bhd | 908.3 | 544.2 | 1,358.3 | 1,377.6 | 1,505.7 |
| 52 | Malayawata Steel Bhd | 470.9 | 399.4 | 283.5 | 401.6 | 470.0 |
| 53 | Malaysia Mining Corp Bhd | 1,385.7 | 1,742.8 | 283.9 | 190.1 | 170.0 |
| 54 | Malaysian Airline System Bhd | 6,135.4 | 7,276.7 | 8,204.3 | 8,498.0 | 10,259.2 |
| 55 | Malaysian Oxygen Bhd | 318.1 | 318.8 | 269.4 | 317.8 | 342.3 |
| 56 | Malaysian Pacific Industries Bhd | 889.5 | 802.5 | 906.0 | 985.6 | 995.5 |
| 57 | Malaysian Resources Corp. Bhd | 1,076.3 | 582.6 | 517.9 | 138.2 | 1,026.5 |
| 58 | Matsushita Electric Co (M) Bhd | 705.3 | 722.5 | 677.5 | 735.5 | 768.2 |
| 59 | MBM Resources Bhd | 805.2 | 305.2 | 421.8 | 479.9 | 479.9 |
| 60 | Mitrajaya Holdings Bhd | 367.7 | 203.5 | 140.0 | 167.6 | 195.3 |
| 61 | Nanyang Press Holdings Bhd | 275.8 | 269.6 | 227.0 | 246.5 | 279.3 |
| 62 | Nestle (Malaysia) Bhd | 1,760.5 | 1,845.9 | 1,709.9 | 1,947.5 | 2,321.0 |
| 63 | Oriental Holdings Bhd | 1,901.8 | 2,113.1 | 2,347.9 | 2,608.8 | 2,378.5 |
| 64 | OYL Industries Bhd | 2,972.2 | 4,268.5 | 4,315.7 | 4,063.4 | 4,178.2 |
| 65 | Palmco Holdings Bhd | 465.0 | 611.3 | 812.6 | 823.5 | 696.9 |
| 66 | Per. Otomobil Nasional Bhd | 5,193.1 | 6,063.9 | 3,976.1 | 6,355.4 | 7,922.9 |
| 67 | Petronas Dagangan Bhd | 3,661.6 | 4,055.4 | 3,640.3 | 4,835.5 | 5,829.6 |
| 68 | Powertek Bhd | 80.8 | 47.0 | 153.4 | 267.5 | 324.7 |
| 69 | PPB Oil Palms Bhd | 1,308.6 | 2,113.2 | 1,682.9 | 1,201.5 | 203.6 |
| 70 | Puncak Niaga Holdings Bhd | 96.2 | 126.2 | 248.5 | 195.7 | 259.7 |
| 71 | Ramatex Bhd | 320.9 | 466.3 | 634.6 | 596.9 | 588.0 |
| 72 | Renong Bhd | 206.8 | 1,726.9 | 2,021.5 | 305.6 | 796.0 |
| 73 | Resorts World Bhd | 1,947.8 | 1,806.7 | 1,866.8 | 2,984.5 | 1,897.7 |
| 74 | Road Builder (M) Holdings Bhd | 451.5 | 418.4 | 374.1 | 285.5 | 321.5 |
| 75 | Sapura Telecommunications Bhd | 341.5 | 644.4 | 271.6 | 62.2 | 79.4 |
| 76 | SCB Developments Bhd | 63.7 | 76.3 | 118.1 | 136.2 | 195.0 |
| 77 | Shangri-La Hotels (M) Bhd | 198.1 | 194.8 | 193.4 | 200.5 | 229.7 |
| 78 | Sime Darby Bhd | 11,553.0 | 10,920.5 | 9,269.0 | 10,109.2 | 10,901.6 |
| 79 | Sime UEP Properties Bhd | 305.9 | 155.4 | 8.0 | 136.8 | 181.4 |
| 80 | Sistem Televisyen M'sia Bhd | 259.6 | 352.5 | 293.0 | 351.6 | 242.6 |
| 81 | Southern Steel Bhd | 1,134.9 | 970.4 | 929.7 | 1,196.0 | 1,370.0 |
| 82 | SP Setia Bhd | 311.2 | 291.8 | 424.7 | 420.9 | 430.2 |
| 83 | STAR Publications (M) Bhd | 219.0 | 182.9 | 230.6 | 322.9 | 372.5 |
| 84 | Sunrise Bhd | 60.8 | 81.1 | 116.2 | 120.0 | 76.8 |
| 85 | Sunway Building Technology Bhd | 439.2 | 275.2 | 194.1 | 151.3 | 152.9 |
| 86 | Sunway City Bhd | 335.9 | 501.0 | 456.0 | 421.2 | 495.6 |
| 87 | Sunway Holdings Incorp. Bhd | 1,309.6 | 910.0 | 641.3 | 894.4 | 1,061.1 |
| 88 | Tai Kwong Yokohama Bhd | 82.7 | 61.6 | 68.6 | 65.5 | 63.2 |
| 89 | Taliworks Corporation Bhd | 30.6 | 31.7 | 33.8 | 84.9 | 85.0 |
| 90 | Tan Chong Motor Holdings Bhd | 2,226.5 | 496.8 | 776.6 | 1,075.7 | 1,348.2 |
| 91 | Tanjong PLC-U | 1,338.1 | 1,458.1 | 1,385.4 | 1,636.9 | 1,734.2 |
| 92 | Telekom Malaysia Bhd | 4,946.7 | 6,533.4 | 7,149.3 | 7,389.4 | 7,839.3 |
| 93 | Tenaga Nasional Bhd | 9,940.0 | 14,311.9 | 11,228.6 | 10,483.3 | 11,570.2 |
| 94 | The New Straits Times Press (M) Bhd | 718.8 | 802.1 | 695.0 | 621.2 | 775.9 |

| No | Company | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|
| 96 | Tractors Malaysia Holdings Bhd | 1,684.6 | 1,172.8 | 761.7 | 1,118.6 | 1,361.3 |
| 97 | Transmile Group Bhd | 150.4 | 145.3 | 95.4 | 130.6 | 136.1 |
| 98 | UMW Holdings Bhd | 3,831.8 | 1,761.8 | 2,403.4 | 2,958.4 | 3,093.5 |
| 99 | Unza Holdings Bhd | 108.3 | 117.4 | 117.0 | 133.8 | 277.3 |
| 100 | WCT Engineering Bhd | 227.3 | 394.8 | 363.2 | 289.8 | 394.1 |
| 101 | WTK Holdings Bhd | 555.9 | 485.7 | 439.8 | 448.7 | 406.4 |
| 102 | Yeo Hiap Seng Bhd | 463.1 | 476.9 | 470.1 | 427.7 | 443.1 |
| 103 | YTL Cement Bhd | 280.2 | 285.3 | 170.0 | 216.2 | 322.7 |
| 104 | YTL Corporation Bhd | 1,651.4 | 1,535.7 | 1,191.1 | 1,361.6 | 1,470.9 |
| 105 | YTL Power Int'l Bhd | 710.0 | 739.1 | 616.9 | 580.9 | 608.8 |

Table 5: Data on Long-term debt, Total Shareholders' equity, Insider ownership and Institutional ownership for the companies in the sample of the study

| No | Company | Long-term Debt (RM million) 2001 | Shareholder Equity (RM million) 2001 | Insider Ownership 2000 | Institutional Ownership 2001 |
|---|---|---|---|---|---|
| 1 | ACP Industries Bhd | - | 304.2 | 0.00 | 0.16 |
| 2 | AIC Corporation Bhd | 107.9 | 216.6 | 0.15 | 0.11 |
| 3 | Amway (M) Holdings Bhd | 52.3 | 88.5 | 0.29 | 0.18 |
| 4 | Asas Dunia Bhd | - | 245.7 | 0.16 | 0.64 |
| 5 | Asia File Corporation Bhd | - | 744.9 | 0.29 | 0.12 |
| 6 | Asiatic Development Bhd | - | 2,531.1 | 0.00 | 0.24 |
| 7 | Austral Amalgamated Bhd | 96.4 | 322.0 | - | 0.04 |
| 8 | Bandar Raya Developments Bhd | 455.8 | 2,214.6 | 0.01 | 0.17 |
| 9 | Berjaya Sports Toto Bhd | 466.2 | 430.1 | 0.01 | 0.22 |
| 10 | British American Tobacco (M) Bhd | 14.2 | 502.6 | 0.00 | 0.18 |
| 11 | Bumi Armada Bhd | 61.5 | 153.5 | 0.08 | 0.04 |
| 12 | Carlsberg Brewery M'sia Bhd | - | 514.2 | - | 0.00 |
| 13 | Celcom Bhd | 397.1 | 769.1 | 0.14 | 0.15 |
| 14 | Cement Ind. Of Malaysia Bhd | - | 1,196.7 | - | 0.01 |
| 15 | Computer Systems Advisers (M) Bhd | 572.6 | 372.7 | 0.16 | 0.03 |
| 16 | Crest Petroleum Bhd | 108.9 | (340.0) | - | 0.18 |
| 17 | Cycle & Carriage Bintang Bhd | 159.2 | 299.6 | 0.01 | 0.05 |
| 18 | Dialog Group Bhd | 61.6 | 4.9 | 0.09 | 0.14 |
| 19 | Diperdana Holdings Bhd | 6.4 | 39.4 | 0.15 | 0.16 |
| 20 | Eastern Pacific Industrial Corporation Bhd | 0.3 | 150.0 | 0.03 | 0.01 |
| 21 | Edaran Otomobil Nasional Bhd | 4.4 | 245.6 | 0.02 | 0.07 |
| 22 | ENG Teknologi Holdings Bhd | 14.8 | 262.2 | 0.01 | 0.08 |
| 23 | Fraser & Neave Hldg Bhd | - | 97.0 | 0.05 | 0.12 |
| 24 | Gamuda Bhd | 14.2 | 352.3 | 0.00 | 0.23 |
| 25 | Genting Bhd | - | 145.9 | 0.00 | 0.30 |
| 26 | Golden Hope Plantations Bhd | 0.3 | 889.8 | 0.00 | 0.15 |
| 27 | Guthrie Ropel Bhd | 221.6 | 631.6 | - | 0.13 |
| 28 | Hap Seng Consolidated Bhd | 189.3 | 276.2 | - | 0.22 |
| 29 | Highlands & Lowland Bhd | - | 499.0 | - | 0.07 |
| 30 | Hong Leong Industries Bhd | - | 88.7 | - | 0.01 |
| 31 | Hume Industries (M) Bhd | 1,493.0 | 587.5 | - | 0.23 |
| 32 | IGB Corporation Bhd | 103.1 | 176.5 | 0.10 | 0.13 |
| 33 | IJM Corporation Bhd | 6.1 | (498.6) | 0.01 | 0.02 |
| 34 | IOI Corporation Bhd | 0.8 | 622.7 | - | 0.01 |
| 35 | IOI Properties Bhd | 453.8 | 1,275.9 | 0.00 | 0.28 |
| 36 | Jaya Tiasa Holdings Bhd | 49.7 | 1,871.9 | - | 0.17 |
| 37 | Johor Port Bhd | 5,605.2 | 216.3 | - | 0.13 |
| 38 | JT International Bhd | 12.2 | 74.2 | 0.02 | 0.00 |
| 39 | Kedah Cement Holdings Bhd | 0.3 | 305.1 | 0.00 | 0.13 |
| 40 | KFC Holdings (M) Bhd | 5.4 | 1,139.5 | 0.00 | 0.25 |
| 41 | Kian Joo Can Factory Bhd | 0.2 | 1,080.5 | - | 0.12 |

| | | Long-term | Shareholder | Insider | Institutional |
|---|---|---|---|---|---|
| | | Debt | Equity | Ownership | Ownership |
| | | (RM million) | (RM million) | | |
| No | Company | 2001 | 2001 | 2000 | 2001 |
| 46 | Land&General Bhd | 378.6 | 662.6 | - | 0.27 |
| 47 | Leader Universal Holdings Bhd | 1,066.1 | 700.9 | 0.00 | 0.15 |
| 48 | Lingui Development Bhd | 424.0 | 409.0 | 0.01 | 0.20 |
| 49 | Magnum Corporation Bhd | 133.2 | 348.6 | 0.01 | 0.34 |
| 50 | Malakoff Bhd | - | 922.7 | 0.01 | 0.33 |
| 51 | Malayan Cement Bhd | 1,338.5 | 718.1 | 0.35 | 0.11 |
| 52 | Malayawata Steel Bhd | 8.1 | 638.3 | 0.08 | 0.26 |
| 53 | Malaysia Mining Corp Bhd | 1,198.6 | 2,312.7 | 0.04 | 0.84 |
| 54 | Malaysian Airline System Bhd | 498.2 | 773.0 | 0.47 | 0.25 |
| 55 | Malaysian Oxygen Bhd | - | 410.7 | 0.05 | 0.13 |
| 56 | Malaysian Pacific Industries Bhd | 39.0 | 1,079.2 | 0.00 | 0.10 |
| 57 | Malaysian Resources Corp. Bhd | - | 633.6 | 0.00 | 0.19 |
| 58 | Matsushita Electric Co (M) Bhd | 71.3 | 227.1 | 0.00 | 0.26 |
| 59 | MBM Resources Bhd | 78.9 | 266.5 | 0.51 | 0.67 |
| 60 | Mitrajaya Holdings Bhd | 4.5 | 139.3 | 0.37 | 0.43 |
| 61 | Nanyang Press Holdings Bhd | 50.0 | 533.0 | - | 0.42 |
| 62 | Nestle (Malaysia) Bhd | 503.4 | 731.2 | - | 0.14 |
| 63 | Oriental Holdings Bhd | 120.0 | 487.9 | 0.01 | 0.32 |
| 64 | OYL Industries Bhd | - | 568.9 | - | 0.08 |
| 65 | Palmco Holdings Bhd | - | 575.2 | 0.00 | 0.25 |
| 66 | Per. Otomobil Nasional Bhd | 269.1 | 1,320.6 | 0.01 | 0.30 |
| 67 | Petronas Dagangan Bhd | 4.9 | 129.4 | 0.01 | 0.20 |
| 68 | Powertek Bhd | 307.0 | 392.4 | - | 0.47 |
| 69 | PPB Oil Palms Bhd | - | 2,201.6 | 0.01 | 0.21 |
| 70 | Puncak Niaga Holdings Bhd | 1,484.2 | 991.2 | 0.00 | 0.18 |
| 71 | Ramatex Bhd | 184.4 | 732.6 | 0.25 | 0.17 |
| 72 | Renong Bhd | 396.4 | 3,082.6 | - | 0.18 |
| 73 | Resorts World Bhd | 7,743.8 | 14,823.9 | 0.00 | 0.22 |
| 74 | Road Builder (M) Holdings Bhd | - | 210.7 | 0.03 | 0.24 |
| 75 | Sapura Telecommunications Bhd | - | 2,421.0 | - | 0.49 |
| 76 | SCB Developments Bhd | 100.6 | 500.5 | - | 0.25 |
| 77 | Shangri-La Hotels (M) Bhd | - | 796.5 | 0.00 | 0.11 |
| 78 | Sime Darby Bhd | 206.6 | 668.3 | - | 0.29 |
| 79 | Sime UEP Properties Bhd | - | 444.4 | 0.01 | 0.13 |
| 80 | Sistem Televisyen M'sia Bhd | - | 3,833.7 | - | 0.69 |
| 81 | Southern Steel Bhd | - | 412.5 | - | 0.25 |
| 82 | SP Setia Bhd | - | 940.5 | 0.00 | 0.44 |
| 86 | Sunway City Bhd | 41.6 | 1,287.7 | 0.03 | 0.23 |
| 87 | Sunway Holdings Incorp. Bhd | 263.0 | 580.0 | 0.00 | 0.33 |
| 88 | Tai Kwong Yokohama Bhd | 507.4 | 2,492.8 | 0.01 | 0.16 |
| 89 | Taliworks Corporation Bhd | 1.5 | 3,230.0 | - | 0.36 |
| 90 | Tan Chong Motor Holdings Bhd | 7,829.9 | 1,888.5 | - | 0.85 |
| 91 | Tanjong PLC-U | 442.6 | 6,457.9 | 0.02 | 0.66 |
| 92 | Telekom Malaysia Bhd | 1,174.8 | 436.0 | 0.02 | 0.21 |
| 93 | Tenaga Nasional Bhd | 3,326.2 | 4,139.8 | 0.02 | 0.25 |

| | | Long-term | Shareholder | Insider | Institutional |
|---|---|---|---|---|---|
| | | Debt | Equity | Ownership | Ownership |
| | | (RM million) | (RM million) | | |
| No | Company | 2001 | 2001 | 2000 | 2001 |
| 98 | UMW Holdings Bhd | 7.0 | 1,598.7 | 0.54 | 0.06 |
| 99 | Unza Holdings Bhd | 1,084.6 | 5,736.8 | 0.03 | 0.10 |
| 100 | WCT Engineering Bhd | 563.3 | 3,008.2 | - | 0.41 |
| 101 | WTK Holdings Bhd | 208.5 | 974.6 | 0.16 | 0.23 |
| 102 | Yeo Hiap Seng Bhd | 747.7 | 1,492.7 | 0.00 | 0.17 |
| 103 | YTL Cement Bhd | 750.0 | 572.3 | 0.00 | 0.31 |
| 104 | YTL Corporation Bhd | 1,454.1 | 3,249.6 | 0.00 | 0.12 |
| 105 | YTL Power Int'l Bhd | 30,631.8 | 16,378.3 | - | 0.21 |

Table 6: Data of the variables used in the study for all the companies in the sample

| | Company | NAF | Insider | Debtratio | Growth | Expense | Efficiency | Institution | Size |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ACP Industries | 6 | 0.013 | 0.382 | 0.152 | 0.850 | 0.552 | 0.341 | 19.711 |
| 2 | AIC Corporation | 8 | 0.512 | 0.296 | 0.266 | 0.899 | 0.678 | 0.675 | 19.523 |
| 3 | Amway | 16 | 0.029 | 0.000 | 0.011 | 0.773 | 1.049 | 0.240 | 20.566 |
| 4 | Asas Dunia | 1 | 0.001 | 0.000 | -0.018 | 1.021 | 0.212 | 0.159 | 18.577 |
| 5 | Asia File Corp | 2 | 0.049 | 0.000 | 0.203 | 0.730 | 0.857 | 0.118 | 19.210 |
| 6 | Asiatic Development | 4 | 0.002 | 0.005 | 0.103 | 0.572 | 0.282 | 0.252 | 20.555 |
| 7 | Austral Enterprises | 3 | 0.015 | -0.012 | -0.061 | 1.926 | 0.105 | 0.021 | 18.380 |
| 8 | Bandar Raya | 4 | 0.000 | 0.000 | 0.024 | 0.818 | 0.202 | 0.121 | 20.189 |
| 9 | BAT | 25 | 0.000 | 1.310 | 0.109 | 0.703 | 1.674 | 0.307 | 23.081 |
| 10 | Berjaya Sports Toto | 24 | 0.539 | 0.004 | 0.139 | 0.812 | 1.329 | 0.056 | 22.020 |
| 11 | Bumi Armada | 1 | 0.154 | 0.498 | 0.132 | 0.885 | 0.559 | 0.113 | 19.663 |
| 12 | Carlsberg Brewery | 19 | 0.007 | 0.000 | 0.065 | 0.813 | 1.310 | 0.134 | 21.226 |
| 13 | Cement Ind.Malaysia | 5 | 0.000 | 0.571 | 0.120 | 0.884 | 0.349 | 0.274 | 20.006 |
| 14 | Computer Sys Advis | 12 | 0.010 | 0.037 | 0.086 | 0.940 | 2.334 | 0.201 | 19.882 |
| 15 | Crest Petroleum | 2 | 0.000 | 0.040 | -0.024 | 2.731 | 0.797 | 0.227 | 19.489 |
| 16 | Cycle & Carriage | 11 | 0.001 | 0.000 | 0.025 | 0.921 | 1.145 | 0.250 | 20.047 |
| 17 | Dialog Group | 2 | 0.000 | 0.000 | 0.286 | 0.890 | 1.516 | 0.302 | 19.847 |
| 18 | Diperdana Corp | 1 | 0.291 | 0.592 | 0.118 | 0.856 | 0.594 | 0.180 | 17.859 |
| 19 | Eastern Pacific Industries | 1 | 0.162 | 0.000 | 0.031 | 0.610 | 0.260 | 0.639 | 18.957 |
| 20 | Edaran Otomobil | 16 | 0.000 | 0.000 | 0.249 | 0.907 | 0.360 | 0.486 | 21.444 |
| 21 | ENG Teknologi | 8 | 0.369 | 0.032 | 0.255 | 0.832 | 0.973 | 0.430 | 19.374 |
| 22 | Fraser & Neave Hldg | 6 | 0.008 | 0.000 | 0.040 | 0.964 | 0.940 | 0.328 | 20.967 |
| 23 | Gamuda | 23 | 0.147 | 0.418 | 0.394 | 0.862 | 0.540 | 0.148 | 21.825 |
| 24 | Genting | 24 | 0.030 | 0.189 | 0.099 | 0.720 | 0.375 | 0.103 | 22.724 |
| 25 | Golden Hope | 19 | 0.000 | 0.000 | 0.049 | 0.859 | 0.368 | 0.689 | 22.023 |
| 26 | Guthrie Ropel | 1 | 0.293 | 0.000 | 0.087 | 0.722 | 0.176 | 0.121 | 19.772 |
| 27 | Hap Seng Consolidated | 3 | 0.000 | 0.001 | 0.064 | 0.633 | 0.160 | 0.015 | 21.082 |
| 28 | Highlands & Lowland | 1 | 0.000 | 0.000 | 0.131 | 0.592 | 0.190 | 0.243 | 21.160 |
| 29 | Hong Leong Industries | 6 | 0.349 | 1.864 | 0.062 | 0.917 | 0.568 | 0.108 | 20.946 |
| 30 | Hume Industries | 5 | 0.000 | 1.521 | 0.028 | 0.950 | 1.084 | 0.149 | 20.742 |
| 31 | IGB | 3 | 0.004 | 0.356 | 0.098 | 0.954 | 0.183 | 0.278 | 20.316 |
| 32 | IJM Corp | 11 | 0.010 | 0.204 | 0.096 | 0.906 | 0.520 | 0.304 | 21.130 |
| 33 | IOI Corporation | 22 | 0.005 | 0.204 | 0.133 | 0.662 | 0.281 | 0.158 | 21.911 |
| 34 | IOI Properties | 21 | 0.030 | 0.032 | 0.136 | 0.551 | 0.252 | 0.233 | 21.216 |
| 35 | Jaya Tiasa | 2 | 0.004 | 0.000 | 0.152 | 0.877 | 0.503 | 0.146 | 20.196 |
| 36 | Johor Port | 2 | 0.000 | 0.351 | 0.051 | 0.708 | 0.239 | 0.133 | 19.944 |
| 37 | JT International | 19 | 0.000 | 0.000 | 0.021 | 0.830 | 1.169 | 0.246 | 20.951 |
| 38 | Kedah Cement | 1 | 0.000 | 0.299 | -0.023 | 0.967 | 0.329 | 0.045 | 20.743 |
| 39 | KFC Holdings | 12 | 0.000 | 0.782 | 0.039 | 0.924 | 1.065 | 0.472 | 20.565 |
| 40 | Kian Joo Can Factory | 10 | 0.011 | 0.246 | 0.052 | 0.872 | 0.663 | 0.321 | 19.730 |
| 41 | KL Kepong | 22 | 0.000 | 0.000 | 0.044 | 0.864 | 0.584 | 0.360 | 22.052 |
| 42 | Konsortium Logistik | 4 | 0.443 | 0.232 | -0.246 | 0.884 | 0.416 | 0.175 | 19.522 |
| 44 | Kumpulan Guthrie | 7 | 0.040 | 0.518 | 0.177 | 0.822 | 0.348 | 0.838 | 21.489 |

| | Company | NAF | Insider | Debtratio | Growth | Expense | Efficiency | Institution | Size |
|---|---|---|---|---|---|---|---|---|---|
| 46 | Leader Universal | 1 | 0.005 | 1.084 | -0.026 | 1.110 | 0.606 | 0.217 | 19.240 |
| 47 | Lingui Development | 7 | 0.472 | 0.644 | 0.137 | 0.814 | 0.543 | 0.250 | 20.153 |
| 48 | Magnum Corporation | 20 | 0.000 | 0.001 | 0.000 | 0.861 | 1.073 | 0.081 | 21.897 |
| 49 | Malakoff | 23 | 0.018 | 0.261 | -0.134 | 1.683 | 0.197 | 0.303 | 21.766 |
| 50 | Malayan Cement | 15 | 0.000 | 0.129 | 0.487 | 0.774 | 0.902 | 0.183 | 21.771 |
| 51 | Malayawata Steel | 2 | 0.000 | 0.000 | 0.028 | 1.010 | 0.599 | 0.074 | 19.279 |
| 52 | Malaysia Mining Corp | 4 | 0.000 | 0.054 | 0.087 | 0.837 | 0.319 | 0.605 | 18.857 |
| 53 | Malaysian Airline | 22 | 0.000 | 4.146 | 0.032 | 1.053 | 0.443 | 0.847 | 21.715 |
| 54 | Malaysian Oxygen | 9 | 0.000 | 0.094 | 0.058 | 0.758 | 0.530 | 0.419 | 21.068 |
| 55 | Malaysian Pacific | 23 | 0.003 | 0.363 | 0.047 | 0.794 | 0.727 | 0.138 | 21.916 |
| 56 | Malaysian Resources | 4 | 0.000 | 2.158 | -0.016 | 1.296 | 0.135 | 0.187 | 20.915 |
| 57 | Matsushita Electric | 1 | 0.001 | 0.028 | 0.067 | 0.916 | 1.300 | 0.184 | 20.177 |
| 58 | MBM Resources | 7 | 0.045 | 0.000 | 0.130 | 0.923 | 1.293 | 0.126 | 20.031 |
| 59 | Mitrajaya | 1 | 0.085 | 0.401 | 0.072 | 0.863 | 1.079 | 0.040 | 18.841 |
| 60 | Nanyang Press | 2 | 0.000 | 0.000 | -0.076 | 0.899 | 0.895 | 0.011 | 19.628 |
| 61 | Nestle Malaysia | 16 | 0.000 | 0.201 | 0.112 | 0.893 | 1.745 | 0.246 | 22.293 |
| 62 | New Straits Times | 18 | 0.000 | 0.309 | 0.097 | 0.993 | 0.301 | 0.290 | 20.800 |
| 63 | Oriental Holdings | 12 | 0.007 | 0.000 | 0.036 | 0.368 | 0.397 | 0.214 | 21.399 |
| 64 | OYL Industries | 9 | 0.000 | 0.688 | 0.028 | 0.946 | 1.369 | 0.136 | 21.495 |
| 65 | Palmco Holdings | 1 | 0.000 | 0.000 | 0.023 | 0.942 | 1.262 | 0.000 | 20.610 |
| 66 | Petronas Dagangan | 3 | 0.000 | 0.027 | 0.165 | 0.932 | 1.938 | 0.173 | 21.463 |
| 67 | Powertek | 16 | 0.000 | 0.000 | 0.179 | 0.436 | 0.252 | 0.113 | 20.863 |
| 68 | PPB Oil Palms | 7 | 0.001 | 0.036 | 0.031 | 0.916 | 1.031 | 0.102 | 20.644 |
| 69 | Proton | 24 | 0.000 | 0.187 | 0.137 | 0.927 | 1.153 | 0.414 | 22.198 |
| 70 | Puncak Niaga Holdings | 13 | 0.001 | 1.497 | 0.278 | 0.621 | 0.141 | 0.181 | 20.840 |
| 71 | Ramatex | 1 | 0.143 | 0.516 | 0.236 | 0.812 | 0.432 | 0.153 | 20.719 |
| 72 | Renong | 3 | 0.000 | 25.908 | 0.038 | 1.548 | 0.054 | 0.129 | 21.299 |
| 73 | Resorts World | 25 | 0.001 | 0.447 | 0.100 | 0.849 | 0.509 | 0.120 | 22.628 |
| 74 | Road Builder | 24 | 0.157 | 0.214 | 0.266 | 0.826 | 0.408 | 0.225 | 21.105 |
| 75 | Sapura | 3 | 0.016 | 0.164 | -0.269 | 1.072 | 0.469 | 0.005 | 20.022 |
| 76 | SCB Developments | 7 | 0.000 | 0.000 | 0.191 | 0.629 | 0.231 | 0.187 | 20.254 |
| 77 | Setia | 14 | 0.254 | 0.252 | 0.197 | 0.801 | 0.446 | 0.171 | 20.623 |
| 78 | Shangri-La Hotel | 1 | 0.000 | 0.000 | 0.029 | 0.848 | 0.225 | 0.010 | 19.932 |
| 79 | Sime Darby | 22 | 0.018 | 0.069 | -0.121 | 0.909 | 0.773 | 0.662 | 23.157 |
| 80 | Sime UEP Properties | 19 | 0.001 | 0.000 | 0.006 | 0.465 | 0.229 | 0.440 | 21.099 |
| 81 | Southern Steel | 1 | 0.159 | 1.536 | 0.057 | 1.024 | 0.593 | 0.028 | 19.236 |
| 82 | STAR Publications | 21 | 0.003 | 0.453 | 0.194 | 0.711 | 0.565 | 0.334 | 21.129 |
| 83 | STM (TV3) | 1 | 0.000 | -0.320 | -0.008 | 1.265 | 0.379 | 0.175 | 18.318 |
| 84 | Sunrise | 1 | 0.011 | 0.531 | 0.185 | 0.717 | 0.233 | 0.047 | 19.026 |
| 85 | Sunway Building Tech | 1 | 0.087 | 12.640 | -0.102 | 1.350 | 0.402 | 0.141 | 18.145 |
| 86 | Sunway City | 4 | 0.032 | 0.910 | 0.098 | 0.999 | 0.229 | 0.194 | 19.827 |
| 87 | Sunway Holdings | 5 | 0.011 | 1.037 | -0.019 | 1.004 | 0.479 | 0.203 | 19.309 |
| 88 | Tai Kwong Yokohama | 1 | 0.146 | 0.163 | 0.015 | 0.931 | 0.833 | 0.161 | 17.798 |
| 89 | Taliworks Corp | 1 | 0.032 | 0.002 | 0.348 | 1.114 | 0.777 | 0.007 | 19.064 |
| 90 | Tan Chong Motor | 20 | 0.007 | 0.000 | -0.154 | 0.923 | 1.157 | 0.115 | 20.676 |
| 92 | Technology Resources | 22 | 0.017 | 2.695 | 0.027 | 0.899 | 0.346 | 0.206 | 21.503 |
| 93 | Telekom Malaysia | 15 | 0.000 | 0.522 | 0.065 | 0.814 | 0.317 | 0.221 | 24.186 |
| 94 | Tenaga Nasional | 26 | 0.000 | 1.870 | 0.109 | 0.948 | 0.260 | 0.209 | 24.227 |

| | Company | NAF | Insider | Debtratio | Growth | Expense | Efficiency | Institution | Size |
|---|---|---|---|---|---|---|---|---|---|
| 96 | Tractors Malaysia | 10 | 0.000 | 0.000 | 0.057 | 0.933 | 1.303 | 0.076 | 20.651 |
| 97 | Transmile Group | 7 | 0.001 | 0.314 | 0.170 | 0.827 | 0.376 | 0.258 | 19.226 |
| 98 | UMW Holdings | 20 | 0.000 | 0.029 | 0.016 | 0.960 | 1.149 | 0.789 | 21.353 |
| 99 | Unza Holdings | 1 | 0.020 | 0.018 | 0.293 | 0.900 | 1.024 | 0.066 | 19.547 |
| 100 | WCT Engineering | 2 | 0.104 | 0.584 | 0.380 | 0.906 | 1.282 | 0.132 | 19.673 |
| 101 | WTK Holdings | 6 | 0.080 | 0.013 | 0.192 | 0.841 | 0.749 | 0.259 | 20.306 |
| 102 | Yeo Hiap Seng | 3 | 0.001 | 0.001 | 0.025 | 0.962 | 1.308 | 0.130 | 19.331 |
| 103 | YTL Cement | 1 | 0.005 | 0.057 | 0.121 | 0.916 | 0.578 | 0.079 | 19.704 |
| 104 | YTL Corporation | 22 | 0.022 | 0.803 | 0.390 | 0.694 | 0.223 | 0.255 | 22.684 |
| 105 | YTL Power | 22 | 0.001 | 0.392 | 0.081 | 0.522 | 0.214 | 0.138 | 22.447 |

APPENDIX 4: FOREIGN SHAREHOLDING STATISTICS ON COMPANIES LISTED ON THE KUALA LUMPUR STOCK EXCHANGE IN 2001

APPENDIX 5: SPSS OUTPUTS OF THE SUBSIDIARY AUXILIARY REGRESSION PERFORMED ON INDEPENDENT VARIABLES 'EXPENSE' AND 'GROWTH'.

For GROWTH:

**Variables Entered/Removed(a)**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | EXPENSE | . | Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100). |

a Dependent Variable: GROWTH

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .339(a) | 0.115 | 0.106 | 0.11762 |

a Predictors: (Constant), EXPENSE

**ANOVA(b)**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 0.185 | 1 | 0.185 | 13.38 | .000(a) |
| | Residual | 1.425 | 103 | 1.38E-02 | | |
| | Total | 1.61 | 104 | | | |

a Predictors: (Constant), EXPENSE

b Dependent Variable: GROWTH

**Coefficients(a)**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 0.224 | 0.038 | | 5.857 | 0 |
| | EXPENSE | -0.147 | 0.04 | -0.339 | -3.658 | 0 |

a Dependent Variable: GROWTH

**Excluded Variables(b)**

| Model | | Beta In | t | Sig. | Partial Correlation | Collinearity Statistics |
|---|---|---|---|---|---|---|
| | | | | | | Tolerance |
| 1 | INSIDER | .093(a) | 1.002 | 0.319 | 0.099 | 0.994 |
| | LEVERAGE | -.016(a) | -.160 | .873 | -.016 | .918 |
| | Efficiency | .077(a) | .829 | .409 | .082 | 1.000 |
| | Institution | .014(a) | .152 | .879 | .015 | .996 |
| | SIZE | .039(a) | .404 | .687 | .040 | .940 |
| a Predictors in the Model: (Constant), EXPENSE | | | | | | |
| b Dependent Variable: GROWTH | | | | | | |

For EXPENSE:

**Variables Entered/Removed(a)**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | GROWTH | . | Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100). |
| 2 | LEVERAGE | . | Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100). |
| 3 | SIZE | . | Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100). |
| a Dependent Variable: EXPENSE | | | |

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .339(a) | .115 | .106 | .271719 |
| 2 | .421(b) | .177 | .161 | .263227 |
| 3 | .472(c) | .223 | .200 | .257066 |

a Predictors: (Constant), GROWTH

b Predictors: (Constant), GROWTH, LEVERAGE

c Predictors: (Constant), GROWTH, LEVERAGE, SIZE

**ANOVA(d)**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | .988 | 1 | .988 | 13.380 | .000(a) |
| | Residual | 7.605 | 103 | 7.383E-02 | | |
| | Total | 8.592 | 104 | | | |
| 2 | Regression | 1.525 | 2 | .763 | 11.005 | .000(b) |
| | Residual | 7.067 | 102 | 6.929E-02 | | |
| | Total | 8.592 | 104 | | | |
| 3 | Regression | 1.918 | 3 | .639 | 9.675 | .000(c) |
| | Residual | 6.674 | 101 | 6.608E-02 | | |
| | Total | 8.592 | 104 | | | |

a Predictors: (Constant), GROWTH

b Predictors: (Constant), GROWTH, LEVERAGE

c Predictors: (Constant), GROWTH, LEVERAGE, SIZE

d Dependent Variable: EXPENSE

**Coefficients(a)**

| | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| Model | | B | Std. Error | Beta | | |
| 1 | (Constant) | .979 | .033 | | 29.809 | .000 |
| | GROWTH | -.783 | .214 | -.339 | -3.658 | .000 |
| 2 | (Constant) | .954 | .033 | | 28.848 | .000 |
| | GROWTH | -.719 | .209 | -.311 | -3.442 | .001 |
| | LEVERAGE | 2.555E-02 | .009 | .252 | 2.784 | .006 |
| 3 | (Constant) | 1.943 | .407 | | 4.775 | .000 |
| | GROWTH | -.657 | .205 | -.285 | -3.200 | .002 |
| | LEVERAGE | 2.619E-02 | .009 | .258 | 2.922 | .004 |
| | SIZE | -4.838E-02 | .020 | -.216 | -2.439 | .016 |

a Dependent Variable: EXPENSE

**Excluded Variables(d)**

| Model | | Beta In | t | Sig. | Partial Correlation | Collinearity Statistics |
|---|---|---|---|---|---|---|
| | | | | | | Tolerance |
| 1 | INSIDER | -.039(a) | -.418 | .677 | -.041 | .986 |
| | LEVERAGE | .252(a) | 2.784 | .006 | .266 | .988 |
| | Efficiency | .028(a) | .304 | .762 | .030 | .994 |
| | Institution | -.054(a) | -.580 | .563 | -.057 | .999 |
| | SIZE | -.208(a) | -2.271 | .025 | -.219 | .986 |
| 2 | INSIDER | -.036(b) | -.402 | .689 | -.040 | .986 |
| | Efficiency | .074(b) | .807 | .422 | .080 | .965 |
| | Institution | -.047(b) | -.522 | .603 | -.052 | .998 |
| | SIZE | -.216(b) | -2.439 | .016 | -.236 | .985 |
| 3 | INSIDER | -.085(c) | -0.945 | 0.347 | -0.094 | 0.942 |
| | Efficiency | .084(c) | 0.941 | 0.349 | 0.094 | 0.962 |
| | Institution | -.005(c) | -0.051 | 0.959 | -0.005 | 0.958 |

a Predictors in the Model: (Constant), GROWTH

b Predictors in the Model: (Constant), GROWTH, LEVERAGE

c Predictors in the Model: (Constant), GROWTH, LEVERAGE, SIZE

d Dependent Variable: EXPENSE

# APPENDIX 6: SPSS OUTPUTS ON THE REGRESSION ANALYSIS USING ENTER METHOD

**Model Summary(b)**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | Durbin Watso |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | |
| 1 | .794(a) | 0.631 | 0.604 | 5 354527 | 0.631 | 23.697 | 7 | 97 | 1. |

a Predictors: (Constant), SIZE, LEVERAGE, GROWTH, Efficiency, Institution, INSIDER, EXPENSE

b Dependent Variable: NAF

**ANOVA(b)**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 4755.907 | 7 | 679.415 | 23.697 | .000(a) |
| | Residual | 2781.083 | 97 | 28.671 | | |
| | Total | 7536.99 | 104 | | | |

a Predictors: (Constant), SIZE, LEVERAGE, GROWTH, Efficiency, Institution, INSIDER, EXPENSE

b Dependent Variable: NAF

**Coefficients(a)**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | -95.268 | 9.759 | | -9.762 | 0 | | |
| | INSIDER | 4.909 | 4.718 | 0.067 | 1.041 | 0.301 | 0.929 | 1.076 |
| | LEVERAGE | -0.224 | 0.198 | -0.074 | -1.128 | 0.262 | 0.874 | 1.145 |
| | GROWTH | -0.637 | 4.531 | -0.009 | -0.141 | 0.889 | 0.867 | 1.153 |
| | EXPENSE | -0.502 | 2.091 | -0.017 | -0.24 | 0.811 | 0.763 | 1.311 |
| | Efficiency | 0.95 | 1.183 | 0.051 | 0.803 | 0.424 | 0.949 | 1.054 |
| | Institution | 6.328 | 3.037 | 0.132 | 2.084 | 0.04 | 0.949 | 1.053 |
| | SIZE | 5.023 | 0.447 | 0.755 | 11.231 | 0 | 0.841 | 1.189 |

a Dependent Variable: NAF

**Residuals Statistics(a)**

| | Minimum | Maximum | Mean | Std. Deviation | N |
|---|---|---|---|---|---|
| Predicted Value | -5.873119 | 27.343809 | 9.67619 | 6.762387 | 105 |
| Residual | -12.343809 | 11.316953 | 0 | 5.171188 | 105 |
| Std. Predicted Value | -2.299 | 2.613 | 0 | 1 | 105 |
| Std. Residual | -2.305 | 2.114 | 0 | 0.966 | 105 |

a Dependent Variable: NAF

APPENDIX 7: SPSS OUTPUTS OF REGRESSION ANALYSIS USING STEPWISE METHOD

**Variables Entered/Removed(a)**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | SIZE | . | Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100). |
| 2 | Institution | . | Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100). |

a Dependent Variable: NAF

**ANOVA(c)**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 4509.526 | 1 | 4509.526 | 153.423 | .000(a) |
| | Residual | 3027.464 | 103 | 29.393 | | |
| | Total | 7536.99 | 104 | | | |
| 2 | Regression | 4643.645 | 2 | 2321.823 | 81.852 | .000(b) |
| | Residual | 2893.345 | 102 | 28.366 | | |
| | Total | 7536.99 | 104 | | | |

a Predictors: (Constant), SIZE

b Predictors: (Constant), SIZE, Institution

c Dependent Variable: NAF

**Excluded Variables(c)**

| Model | | Beta In | t | Sig. | Partial Correlation | Collinearity Statistics | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Tolerance | VIF | Minimum Tolerance |
| 1 | INSIDER | .079(a) | 1.242 | 0.217 | 0.122 | 0.963 | 1.039 | 0.963 |
| | LEVERAGE | -.093(a) | -1.505 | .135 | -.147 | 1.000 | 1.000 | 1.000 |
| | GROWTH | .019(a) | .309 | .758 | .031 | .986 | 1.015 | .986 |
| | EXPENSE | -.047(a) | -.734 | .464 | -.073 | .940 | 1.064 | .940 |
| | Efficiency | .057(a) | .904 | .368 | .089 | .998 | 1.002 | .998 |
| | Institution | .136(a) | 2.174 | .032 | .210 | .960 | 1.042 | .960 |
| 2 | INSIDER | .070(b) | 1.116 | .267 | .110 | .958 | 1.043 | .920 |
| | LEVERAGE | -.089(b) | -1.455 | .149 | -.143 | .998 | 1.002 | .958 |
| | GROWTH | .018(b) | .286 | .775 | .028 | .986 | 1.015 | .947 |
| | EXPENSE | -.045(b) | -.709 | .480 | -.070 | .939 | 1.064 | .905 |
| | Efficiency | .065(b) | 1.056 | .293 | .105 | .994 | 1.006 | .956 |

a Predictors in the Model: (Constant), SIZE

b Predictors in the Model: (Constant), SIZE, Institution

c Dependent Variable: NAF

**Collinearity Diagnostics(a)**

| Model | Dimension | Eigenvalue | Condition Index | Variance Proportions | | |
|---|---|---|---|---|---|---|
| | | | | (Constant) | SIZE | Institution |
| 1 | 1 | 1.998 | 1.000 | .00 | .00 | |
| | 2 | .001913 | 32.316 | 1.00 | 1.00 | |
| 2 | 1 | 2.724690 | 1.000 | .00 | .00 | .04 |
| | 2 | .273448 | 3.157 | .00 | .00 | .93 |
| | 3 | .001862 | 38.250 | 1.00 | 1.00 | .03 |

a Dependent Variable: NAF

**Residuals Statistics(a)**

| | Minimum | Maximum | Mean | Std. Deviation | N |
|---|---|---|---|---|---|
| Predicted Value | -4.503866 | 27.701006 | 9.676190 | 6.682098 | 105 |
| Residual | -12.579538 | 11.682533 | .000000 | 5.274526 | 105 |
| Std. Predicted Value | -2.122 | 2.697 | .000 | 1.000 | 105 |
| Std. Residual | -2.362 | 2.193 | .000 | .990 | 105 |

a Dependent Variable: NAF

**Model Summary(c)**

| Model | R | $R^2$ | Adjusted $R^2$ | Std. Error of the Estimate | Change Statistics | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | $R^2$ Change | F Change | df1 | df2 | |
| 1 | .774(a) | 0.598 | 0.594 | 5.421518 | 0.598 | 153.423 | 1 | 103 | |
| 2 | .785(b) | 0.616 | 0.609 | 5.325986 | 0.018 | 4.728 | 1 | 102 | 1.06 |

a Predictors: (Constant), SIZE

b Predictors: (Constant), SIZE, Institution

c Dependent Variable: NAF

**Coefficients(a)**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Correlations | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Zero-order | Partial | Tolerance | VIF |
| 1 | (Constant) | -96.113 | 8.557 | | -11.232 | 0 | | | | |
| | SIZE | 5.143 | 0.415 | 0.774 | 12.386 | 0 | 0.774 | 0.774 | 1 | 1 |
| 2 | (Constant) | -93.845 | 8.471 | | -11.079 | 0 | | | | |
| | SIZE | 4.961 | 0.416 | 0.746 | 11.913 | 0 | 0.774 | 0.763 | 0.96 | 1 |
| | Institution | 6.533 | 3.004 | 0.136 | 2.174 | 0.032 | 0.286 | 0.21 | 0.96 | 1 |

a Dependent Variable: NAF