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# EARNINGS MANAGEMENT IN MALAYSIA: A STUDY ON EFFECTS OF ACCOUNTING CHOICES

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*This study examines the reasons for earnings management in Malaysia by using a sample of companies listed on the Kuala Lumpur Stock Exchange. Traditional explanatory variables for earnings management (such as size and debt-to-equity ratio), tax rate, internal financing, and ownership variables were included in the model to explain the choices of accounting accruals. The study uses data for public companies for years 1995 to 1999. Since the economic downturn (1997) and market crash (1998) years are included in the study, this research is also able to evaluate the effect of these events on earnings management. This study finds that at least two factors affect earnings management in Malaysia; size of the company, and nominee's (security brokers and investment bankers) ownership.*

*JEL Classification: M41*

**Keywords:** *Earnings Management, Malaysia, discretionary accruals*

## Introduction

Current news about firms such as Enron has brought more attention to the questions of how and why firms manage earnings. Accounting numbers form a fundamental part of an organization's efficient contracting technology. Since many of the terms, conditions, and covenants found in contracts use accounting

variables, contractual arrangements and the associated contracting costs are major determinants of accounting method choices (hence earnings management). Thus, contracting theory is able to predict and explain accounting choices (see Watts and Zimmerman, 1978; Watts, 1977, Hagerman and Zmijewski, 1979 among others)). Some reasons for these choices include the existence of contracts between the firms and external/internal parties and market pressure for firms to perform at an expected level.

It is sometimes suggested that the practice of earnings management often results in inaccurate and misleading financial reports. The income reported in the financial statements is not an exact amount but rather is an amount selected from a continuum of amounts derived from the application of different acceptable accounting accrual choices (Healy and Wahlen, 1999 and Dechow and Skinner, 2000). Firms can choose between various allowable accounting methods or can apply different assumptions or estimates within an accounting method. Hence, the role of accrual accounting is believed to have caused some forms of earnings management, such as income smoothing, which are hard to distinguish from appropriate accrual accounting choices. The practice of earnings management has digressed from the primary focus of financial reporting, which is to provide information on the company's performance measured by earnings and its components (Dechow and Skinner, 2000).

Pressure to manage earnings does not stem from a single force. Factors such as analysts' forecasts, access to debt markets, competition, contractual obligation, a roaring stock market, new financial transactions, market disregard of big charges, merger attractiveness, management compensation, short-term focus, unrealistic plans and budgets, period-end requests from superiors, periods of excessive profit followed by a fear of subsequent decline, concealing unlawful transactions, personal bonuses, promotions, focus on team, and job retention are among the reasons that are mentioned in the literature (Duncan, 2001). The effects of these variables on earnings management in different countries may be different. For example, the debt hypothesis suggests that the larger the firm's debt-to-equity ratio the more managers are expected to choose income-increasing accruals. However, in the Japanese business environment this hypothesis does not hold. It is known that managers of larger companies in Japan are more likely to choose income-decreasing accruals (Kester, 1992; Phan and Yoshikawa, 1996; Pourjalali and Hansen, 1996).

There is evidence that managers of companies in both Japan and the United States chose income-increasing accounting accruals to increase their bonuses and the amount of outside funding. For Japanese companies income-increasing choices were also found to be positively associated with the ownership by individual investors and trust companies, but negatively associated with ownership by other corporations and financial institutions (Darrrough, Pourjalali, and Saudagaran, 1998). The choices of accounting accruals by managers may also be affected by differences in the socio-economic and institutional environments in different countries. Furthermore, sudden economic changes (such as sudden market declines or market growth) may result in different incentive sets for earnings management. For example, the 1990 market crash in Japan resulted in changes in economic factors which had an identifiable effect on the choices of accounting accruals (Darrrough, Pourjalali, and Saudagaran, 1998).

Roubi and Richardson, (1998) study earnings management of nonmanufacturing companies in Malaysia, Singapore and Canada in response to changes in tax rates. Their

analysis provides evidence on managing current discretionary accruals by companies in Canada and Singapore similar to that found for the USA. They attribute weaker Malaysian results to cultural factors.

Adhikari, et. al (2005) also investigate earnings management of Malaysian companies in response to anticipated changes in tax policy. They find that large Malaysian firms with low effective tax rates decrease book income prior to a reduction in corporate tax rates in order to influence tax policy. These findings are consistent with prior evidence in the U.S. that firms use accounting choice to achieve economic objectives. Saleh, Iskandar, and Rahma (2003) also provide some evidence that listed companies in Malaysia may practise earnings management. The current study adds to our knowledge on the choices of accounting accruals (hence earnings management) in Malaysia by using a different method for measuring the choices of accruals and performing a multi-period, vs. one-period, analysis of these choices.

Furthermore, this study extends previous studies by examining factors that may influence the accounting accrual choices by Malaysian managers within the socio-economic and institutional environment of Malaysia. Due to the economic crisis in 1997-1998, there was a rapid withdrawal of private capital by foreign investors and rapid expansion of credit to companies operating in Malaysia (Mahbob and Govindan, 2000). As a result, the corporate sector became more leveraged and heavily dependent on commercial bank financing after 1997. Financial difficulties faced by companies might have become an important factor that drove managers to improve upon their performance through earnings management. Meanwhile, the intervention by the Malaysian government to speed up the process of economic recovery in 1999 by reducing interest rates, increasing liquidity in the banking system, establishing a national asset management company, Danaharta, to buy non-performing loans from banks, and the establishment of Danamodal to capitalize financial institutions, might have become mitigating factors to the practice of earnings management.<sup>1</sup>

We expand on the previous Malaysian studies by including all firms, other than those in the financial services rather than limiting the study to non-manufacturing companies. We also increase the number of variables which potentially impact earnings management to include debt covenants, political costs, internal financing, and equity ownership. The ownership variables that are included here are four types: individuals, managerial ownership, institutional ownership and nominee ownership<sup>2</sup>. As there is a possibility that managers of Malaysian companies had different incentives for earnings management in the years before and after the economic crisis, we test earnings management in Malaysia both before and after the economic crisis.

The findings of this study are expected to shed more light on the reasons for earnings management in Malaysia. Consequently, it is expected that the results of this study may help the Malaysian standard setters better evaluate current accounting practices in Malaysian corporations. The rest of the paper is organized as follows. Section II provides the literature review and hypotheses development. Section III describes the methodology used in this study. Empirical results are presented in Section IV and Section V offers concluding remarks.

## Literature Review and Hypothesis Development

Earlier studies typically were interested in the choice between different accounting methods. However, more recently, accounting research has focused on the firm's discretionary accruals (e.g. Healy, 1985; De Angelo, 1988; Jones, 1991; Cahan, 1992; Dechow, Sloan and Sweeney, 1995; Holthausen et al., 1995; Dechow and Dichev, 2002, Adhikari, et al, 2005). Discretionary accruals are defined as the part of total accruals that can be adjusted by managers within the constraints of accounting principles. These studies assume that total accruals are based on the activity of the firm and the discretionary portion is the amount that is being "managed" by the firm.

The incentives for earnings management include capital market expectation and valuation, contracts written in terms of accounting numbers, and anti-trust or other government regulation (Healy and Wahlen, 1999). The initial empirical studies in accounting choice used positive agency costs of debt and compensation contracts and positive information and lobbying costs in the political process to generate hypotheses about accounting choice. For example, Watts (1977) recognized the implications of using accounting numbers in debt contracts on accounting choice and generated hypotheses about the effect of debt covenants on accounting accrual choice. There is no question that contracting costs that arise in market transactions external to the firm or transactions in the political process are crucial to models of both the organization of the firm and its choices of accounting accruals.

The extent to which accounting choice affects the contracting parties' wealth depends on the relative magnitudes of the contracting costs. Contracts that use accounting numbers are not effective in aligning managers' and contracting parties' interests if managers have complete discretion over the reported accounting numbers. When managers exercise this discretion, it can be to increase the wealth of the contracting parties or make the manager better off at the expense of some other contracting party or parties (Watts and Zimmerman, 1990).

It is possible that there are differences in earnings management behavior of Malaysian and U.S. companies. Roubi and Richardson (1998) find that earnings management in relation to tax policy changes are similar in the U.S., Canada and Singapore, but differ for Malaysian companies. They attribute the difference in behavior to differences in culture. Similarly, Guan, et al. (2005) show that earnings management is linked to cultural factors. Therefore, it remains an empirical question as to whether or not Malaysian companies will exhibit similar earnings management behavior as U.S. companies.

Darrough, Pourjalali, and Saudagaran (1998) provide evidence that similar variables affected U.S. and Japanese earnings management in the 1990s. For example, they found that the debt-to-equity ratio explains accounting accruals choices in 1991 and 1992, but is not a determinant for 1989 and 1990. In addition, Land and Lang (2002) provide evidence that accrual/cash flow correlations (or accounting practices) have become more similar across countries over time. These findings may suggest that over time, managers operating in different countries adopt similar accounting accruals as their counterparts in the U.S. Given that the Malaysian Institute of Accountants (MIA) has been adopting International Accounting Standards (IASs) and the Malaysian Accounting Standards Board (MASB) continues to do so, it is very possible that the variables explaining earnings management in the U.S. can explain earnings management in Malaysian companies<sup>3</sup>.

Prior research on earnings management in U.S. firms has identified a large set of variables that influence accounting choices. However, this study is limited to variables whose disclosure is required in Malaysia<sup>4</sup>. The explanatory variables for this study are limited to debt covenants, political cost, internal or external financing, ownership structure and the effect of the economic recession of 1997-1998. These variables are discussed in more details in the following paragraphs.

### **Debt Covenants**

Watts (1977), using the results of Jensen and Meckling (1976), is the first to suggest that debt covenants might also influence the choice of accounting policies. Most accounting choice research has used the debt-to-equity ratio as a surrogate for a firm's closeness to debt covenant violations and found that the higher the debt-to-equity ratio, the more likely managers are to choose income-increasing accounting methods. Collins, Rozeff and Dhaliwal (1980), Holthausen (1980) and Leftwich (1980) argue that the higher the firms' debt-to-equity ratio, the more binding is the firms' debt covenants. Hence, they hypothesized that high debt-to-equity ratios are associated with income-increasing accounting alternatives. Thus, as the debt-to-equity ratio increases, income-increasing activity is expected; that is, a positive association is predicted.

Given the rapid economic development of Malaysia in the first part of the 1990s, it is possible that the debt variable had no, or little, effect on earnings management. However, as the economic growth rate declined and the economic recession began, it is possible that managers of Malaysian companies become more concerned about the debt market. Hence, Malaysian behavior may become similar to their U.S. counterparts in choosing earnings increasing accruals as the debt levels increased.

H1: The larger the Malaysian firm's debt-to-equity ratio, the more likely the manager is to choose income-increasing accruals.

### **Political Costs**

Past studies (Watts and Zimmerman, 1978; Zmijewski and Hagermen, 1981; Lilien and Pastena, 1982; Daley and Vigeland, 1983) often used size (measured by total assets) as a proxy for political sensitivity. Watts and Zimmerman (1978) suggest that in order to avoid the potential negative attention of government institutions, corporations employ a number of devices such as social responsibility campaigns in the media, government lobbying and selection of accounting procedures to minimize reported earnings. Because the public associates high profits with monopoly, firms would lower their reported earnings to reduce the likelihood of adverse political actions and thereby reduce its expected costs. Also included in political costs are the costs associated with labor unions which increase their demands of firms showing large reported profits.

Watts and Zimmerman (1990) test the political cost hypothesis, predicting that larger firms are more likely to use accounting choices that reduce reported profits. They conclude that the evidence is consistent with the political cost hypothesis. However, there are difficulties with using firm size to proxy for political costs, including the likelihood that it may proxy for many other effects such as industry membership (Ball and Foster, 1982).

Despite the difficulties in using firm size as a proxy for political costs, an interesting finding is the consistency of the sign of the relationship between size and accounting choice across a variety of studies of U.S. companies. The larger firms tend to use income-decreasing accounting methods. However, this expectation may not hold for Malaysian companies. For example, the Malaysian government has not been as concerned with anti-trust regulation as has the United States. Hence, the government's political pressure on Malaysian companies may be considered less invasive when compared to that of the U.S.

As mentioned earlier, the size variable may be a proxy for effects other than political sensitivity. For example, the operating characteristics of smaller firms may be significantly different from those of larger firms (e.g., greater default risk). Thus, it seems possible that accounting accrual behavior may differ based on the size of the firm because of factors other than political sensitivity. Darrough, Pourjalali and Saudagaran (1998) show that prior to the Japanese market crash of 1990, the size effect on choices of accounting accruals was either insignificant or in a direction contrary to expectations based on U.S. firm research. Although we do not believe that the size hypothesis will necessarily hold for Malaysian companies, the following hypothesis will be tested:

H2: The larger the size of the Malaysian firm, the more likely the manager is to choose income-decreasing accruals.

### **Tax Rate**

Hand and Skantz (1998) suggest that the findings supporting the political cost hypothesis are due to larger firms having more wealth available to be taxed by the government or special interest parties. Management may thus change accounting accruals to minimize company taxes. The influence of tax on other choices of accounting accruals can be related to the income tax rates. The higher the tax rate, the more beneficial income-decreasing methods would be. Adhikari, et. al (2005) report that larger Malaysian firms with low effective tax rates decreased their book income prior to a reduction in the tax rates. They provide evidence that tax rates affect accrual choices. However, given that the Malaysian government provided tax incentives (lower rates) after the market crash, there is less reason to believe that this hypothesis will hold after the Malaysian economic recession.. The following hypothesis is suggested to support the effect of tax on the choice of accounting accruals<sup>5</sup>:

H3: The higher the Malaysian firm's tax rate, the more likely the manager is expected to choose income-decreasing accruals.

### **Internal Financing**

Although the debt covenant variable (debt-to-equity ratio) captures the effect of the company's dependency on outside financing sources, it ignores the effect of internal source of financing, namely appropriated retained earnings. Once appropriated, the retained earnings cannot be used for dividend payments. The more firms are able to finance their operations via internal financing, the less they will need to obtain capital from external sources (an opposite and negative relationship between internal and external financing can be expected). Consequently, we anticipate that the managers who need more external

financing are more likely to use discretionary accounting accruals to present a better picture of their firms to outside parties. Since data are available to calculate internal financing (ratio of Appropriated Retained Earnings to Net Assets), we will use this ratio to test this suggestion with an expectation that there will be a negative relationship between internal financing and income-increasing choices of accounting accruals (opposite to the hypothesized sign in the case of external financing).

H4: The lower the internal financing, the more likely that the manager chooses income increasing accruals.

### Ownership Variables

Based on the World Bank (1999) assessment, companies listed on the Kuala Lumpur Stock Exchange (KLSE) are categorised into four groups based on the relationship between the control and cash flow rights of the parties controlling the companies<sup>6</sup>. Given that the degree of control on cash flow rights differs by ownership category, it is possible that the degree of ownership by individual investors and others affects management's accounting accrual selection in Malaysia.

**Ownership by Individual Investors:** Ke, Petroni and Safieddine (1999) compare the use of accounting-based incentive pay contracts across insurance firms with diffuse ownership, (i.e. those that are publicly-held) and insurance firms with the most concentrated ownership (i.e. those that are privately-held). They find a significant positive association between return on assets and the level of executive compensation only in the publicly-held insurance companies. The change in compensation was also significantly more sensitive to the change in return on assets for publicly-held insurers than privately-held insurers. Results suggest that within privately-held firms, the reliance on accounting information for performance measurement is reduced due to relatively less separation between ownership and control. Due to the separation of ownership and control in many public corporations, the use of accounting information in the design of executive compensation is one of the most important issues in corporate governance.

Darrough, Pourjalali and Saudagaran (1998) address the question of which factors influence accounting accrual choices by managers in Japan. In examining the effect of ownership on earnings management, they use five ownership categories: individual investors, management, securities brokers and investment trusts, other corporations, and other financial institutions. The time horizon of the ownership share of these different categories of investors is expected to vary. Their study shows that income-increasing choices are positively associated with the ownership by individual investors and trust companies, but negatively associated with the ownership by other corporations and financial institutions.

Past studies show that U.S. companies have strong incentives to provide a more positive picture of the firm to individual investors who are the most important source of capital<sup>7</sup> (Pourjalali, 1999). Hence, these companies choose accounting accruals to either smooth or increase income. In Japan, where individual investors hold only 24 per cent of total outstanding shares, there is less incentive for managers to manage earnings to paint a more positive picture of the company. Nevertheless, on the margin, as individual ownership increases, companies are expected to try to provide a better financial picture.



The same type of relationship might exist in Malaysian companies. The following states this hypothesis.

H5: The higher the degrees of individual investors in the Malaysian firm's ownership structure, the more likely the manager is to choose income-increasing accruals.

**Ownership by the Management:** Research revealed that manager-controlled firms and owner-controlled firms have different goals. One way these differences manifest themselves is through the choice of accounting methods (e.g., Hunt, 1985 and Dhaliwal et. al. 1982). Thus, the hypothesis is that the degree of managerial control affects accounting choices.

One possible measure of managerial control is the per centage ownership of shares by the management. As ownership by management increases, managerial control increases. In the Malaysian environment, management has at least two incentives to choose income-increasing accruals. First, income-increasing methods present a more favorable financial picture and may help prevent a takeover. Managers' resistance to takeovers is explained by the fact that they often lose their jobs or prerequisites (Azaradis and Stiglitz, 1983). Second, accounting-based bonus schemes are more likely to be found in manager-controlled firms (Dhaliwal et al., 1982).

In Malaysia, a manager's bonus is based on current income or other items derived using current income. Thus, it is suggested that managers in Malaysia would choose income-increasing accounting accruals to increase their bonuses. However, the choice is also affected by their degree of ownership in the company. Managers of Malaysian firms that have a lower degree of ownership in their companies may choose income-increasing accruals to increase their personal wealth via increased bonuses more than those managers who have a higher degree of ownership in their companies. The following hypothesis tests this conjecture:

H6: The lower the degrees of ownership by management in Malaysian firms, the more likely the manager is to choose income-increasing accruals.

**Institutional Ownership:** Institutional ownership provides a significant amount of the capital necessary for corporations. Institutional investors are more interested in long-term benefits from their investments. They do not have strong incentives to increase their income by choosing income-increasing accruals (Phan and Yoshikawa, 1996). On the contrary, they have incentives to choose income-decreasing accruals in an attempt to provide long-term benefits such as minimization of tax payments. The following hypothesis tests this theory:

H7: The higher the degree of ownership by other institutions in Malaysian firms, the more likely the manager is to choose income-decreasing accruals.

**Nominee Ownership:** The final ownership hypothesis is related to the effect of investment by security brokers and investment trusts. Both these groups have a short-term return perspective (versus investments by other corporations and institutions). As a result, we expect a positive relationship between the choice of income-increasing accounting accruals and the degree of ownership by these groups of investors. The following hypothesis is tested:

H8: The higher the degree of ownership by securities brokers and investment trusts in Malaysian firms, the more likely the manager is to choose income-increasing accruals.

### The 1997-1998 Financial Crisis

The financial crisis in 1997-98 caused the drop in Ringgit in Malaysia<sup>8</sup>. The response of the government was to protect the economy from increasing global pressures on the Malaysian Economy. For example, the government introduced new exchange controls in 1998 to prevent further manipulation of its currency. Furthermore, the government discouraged the transfer of currency to outside of Malaysia for at least a year. At the same time the government took many steps to increase the confidence of the foreign investments (such as implementing different level of governmental guarantees)<sup>9</sup>. Subsequently, since the economic environment has undergone a major change, the study must consider the possibility that the managers of Malaysian companies had different incentives for earnings management in the periods before and after the financial crisis. For this reason, the test results are provided for the periods before and after the Malaysian financial crisis.

## Methodology

### Sample Selection

The sample consists of companies in all industries (excluding financial services) that are listed on the main board of the Kuala Lumpur Stock Exchange (KLSE) for the 10-year period from 1990 to 1999<sup>10</sup>. The 10-year window was used to provide the opportunity to calculate the amount of earnings management (manipulation in accounting accruals) for years 1995 thorough 1999<sup>11</sup>. A total of 248 listed companies on the KLSE were identified, but eight companies were excluded due to unavailability of data items (resulting in 240 companies in the initial sample). Additional companies were eliminated from individual years because required information was not available for them during the specific year under study. As there were no electronic databases containing this information, data was collected directly from the financial statements of the companies. The sample may include the companies with financial difficulties (known as PN4<sup>12</sup>) as they were listed in the main board before being classified as PN4 companies in year 2001. Table 1 provides a summary of the sample companies for each year during the period under study.

Table 1: Summary of Sample

Sample/Year	1995	1996	1997	1998	1999	1995-1999 (Company-year)
Total companies	240	240	240	240	240	1200
Companies with missing data	52	45	43	44	124	308
Selected companies	188	195	197	196	116	892

## Dependent Variable

The dependent variable in this study is the estimated amount of manipulation in accounting accruals. Many of the past studies have used three different approaches in defining the accounting choice variable: (1) single procedures (e.g. Hagerman and Zmijewski, 1979); two (2) sets of procedures (e.g. Zmijewski and Hagerman, 1981; Press and Weintrop, 1990; Inoue and Thomas, 1996); (3) and net accruals (e.g. Healy, 1985; DeAngelo, 1988). The discretionary accruals concept was subsequently developed (Jones, 1991; Dechow, Sloan and Sweeney, 1995; Pourjalali and Hansen, 1996) and provided an improved means of detecting earnings management. Jones (1991) developed a model to capture the discretionary component of total accruals. She used an expectation model for total accruals to control for changes in the economic circumstances of each firm in order to relax the assumption that the changes in total accruals are due solely to changes in discretionary accruals. The expectation model uses an estimation period for each firm that ranges between 14 and 32 years.

Dechow, Sloan and Sweeney (1995) assess the relative performance of five alternative discretionary accrual models at detecting earnings management. Their evaluation was made on alternative accrual-based models for detecting earnings management by comparing the specification and power of commonly used test statistics across the measures of discretionary accruals. They found that all of the models appear well specified when applied to a random sample of firm-years. Furthermore, the models all generate tests of low power for earnings management of economically plausible magnitudes (e.g. one to five per cent of total assets). They concluded that a modified version of the Jones (1991) model provides the most powerful test of earnings management.

Pourjalali and Hansen (1996) subsequently developed a model that measures the amount of manipulation in the discretionary accruals. This model was developed to improve on Jones' (1991) model. They argue that the Jones (1991) model requires the use of a long stream of historical data to establish the expectation model. The long historical data necessary to establish the model may not be available and hence the model could not be used. Pourjalali and Hansen (1996) use only five (5) years of data to develop their model.

## The Discretionary Amount of Accrual Model

The model used here to measure the manipulation in the amount of discretionary accruals is based on the modified version of Pourjalali and Hansen (1996) that was also used in Darrough, Pourjalali and Saudagaran (1998). The model is based on the assumption that discretionary choices can affect revenues, variable expenses, and fixed expenses. As a result, the total income effect of the discretionary choice of accounting accruals,  $A_t$ , can be expressed as the sum of three discretionary sub-components:

$$A_t = A_{rt} + A_{vt} + A_{ft}$$

Where;

$A_t$  = the total income effect of the discretionary choices for period  $t$

$A_{rt}$  = the discretionary revenue effect

$A_{vt}$  = the discretionary variable expense accrual effect

$A_{ft}$  = the discretionary fixed expense accrual effect

The details on how these three discretionary components are derived and their related assumptions are discussed in Appendix 1 of this paper.

In this study, the value of this variable is calculated for each year from 1995 to 1999. Each year's discretionary accrual is estimated based on financial data for the five years prior to the year under study. For example, the accrual effect for 1995 is estimated by using the financial information for years 1990 to 1994.

## **Independent Variables**

### **Debt Covenants**

The extent of a firm's closeness to debt covenants is measured by the debt-to-equity ratio. This ratio has been extensively used to measure debt covenants in past studies (Watts, 1977; Jensen and Meckling, 1976; Collins, Rozeff and Dhaliwal, 1980; Halthausen, 1980; Leftwich, 1980; Duke and Hunt, 1990)

### **Political Costs**

As mentioned previously, the political cost variables may be proxied for with either total assets or total number of employees. Since the total number of employees is not available, we use (the natural log of) total assets as a proxy for the political costs. A similar measure has also been used in several prior studies (Watts and Zimmerman, 1978, 1990; Zmijewski and Hagermen, 1981; Lilien and Pastena, 1982; Daley and Vigeland, 1983; Ball and Foster, 1982).

### **Tax Rate**

Since it is not possible to determine the "true" marginal tax rate (i.e. the marginal tax rate without earnings management), this study uses an average effective tax rate based on the actual tax liability and income. To adjust for the benefit from depreciation expenses, the effective tax rate is estimated as the ratio of tax paid and accrued to current income plus depreciation.

### **Internal/External Financing**

We use the ratio of appropriated retained earnings to net assets to calculate the degree of internal financing. It is expected that when internal financing decreases, firms have more incentive to choose income-increasing accounting accruals. Past studies (such as Darrough, Pourjalali and Saudagaran, 1998) have also used this ratio to measure internal financing.

### **Ownership Structure**

The ownership structure is measured based on four ownership categories: individual ownership, managerial ownership, institutional ownership, and nominee's ownership. The variables used to measure the four ownership categories is as follows:

- Individual ownership is measured by the proportion of ordinary shares held by individual (and substantial, i.e., 5% or more) shareholders.
- Managerial ownership is measured by the proportion of ordinary shares held by the CEO and executive directors and shares in which they are deemed to have an interest.
- Institutional ownership is measured by the proportion of ordinary shares held by institutional block holders (including corporations, statutory boards, and government).
- Nominee ownership is measured by the proportion of ordinary shares held by security brokers and investment trusts.

## Results of the Study

### Independent Variables

Table 2 provides descriptive statistics of these variables. The information in the table reflects the average performance of the company with respect to each variable over the period 1995 to 1999<sup>13</sup>.

Table 2: Descriptive Statistics for Independent Variables

Variable	N	Mean	Std Dev	Minimum	Maximum
Total Debt-to-equity Ratio	892	0.1363	3.5790	-4.17995	94.0591
Natural Log of total Assets	892	20.38244	1.35955	15.65357	24.36653
Tax Rate	892	-0.30189	2.40933	-66.33060	5.08471
Internal Financing	892	0.08828	0.72668	-11.66910	1.28960
Individual Ownership	892	0.16002	0.18336	0	0.98590
Management Ownership	892	0.16527	0.20452	0	0.98089
Institutional Ownership	892	0.41797	0.28850	0	0.99936
Nominee's Ownership	892	0.25674	0.24090	0	0.99991

Variable definition:

Total Debt-to-equity Ratio	: Ratio of total debt to total equity.
Natural Log of total Assets	: Natural log of total Assets.
Tax Rate	: Ratio of tax paid and accrued to current income plus depreciation.
Internal Financing	: Ratio of appropriated retained earnings on total assets
Individual Ownership	: Measured by the proportion of ordinary shares held by individual (and substantial, i.e., 5% or more) shareholders.
Managerial ownership	: Measured by the proportion of ordinary shares held by the CEO and executive directors and shares in which they are deemed to have an interest.
Institutional ownership	: Measured by the proportion of ordinary shares held by institutional blockholders (including corporations, statutory boards, and government).
Nominee ownership	: Measured by the proportion of ordinary shares held by security brokers and investment trusts.

Table 3 reports the correlation matrix for the independent variables. As the Table indicates, statistically significant correlations are mostly among the ownership variables. This is not surprising as we expected that similar patterns of ownership would be present in different groups of industries<sup>14</sup>. Given the significant degrees of correlations among the ownership variables, it is possible that the effect of one ownership group on earnings management may be captured by another ownership variable. Consequently, one must be cautious when interpreting the results of the ownership variables.

Table 3: Correlation Matrix for All Independent Variables

Variables	Total Debt-to-equity Ratio	Natural Log of total Assets	Tax Rate	Management Ownership	Individual Ownership	Nominee Ownership	Institutional Ownership	Internal Financing
Total Debt-to-equity Ratio	1							
Natural Log of total Assets	0.03378 0.3135	1						
Tax Rate	-0.00138 0.9672	0.02562 0.4448	1					
Management Ownership	-0.03617 0.2805	0.02138 0.5236	-0.0023 0.9446	1				
Individual Ownership	<b>-0.06666</b> <b>0.0466</b>	<b>-0.15083</b> <b>&lt;.0001</b>	0.00384 0.9087	<b>-0.11749</b> <b>0.0004</b>	1			
Nominee Ownership	0.02844 0.3962	<b>0.14826</b> <b>&lt;.0001</b>	0.01862 0.5786	<b>-0.1916</b> <b>&lt;.0001</b>	<b>-0.26822</b> <b>&lt;.0001</b>	1		
Institutional Ownership	0.04607 0.1692	-0.03874 0.2478	-0.0164 0.6255	<b>-0.4724</b> <b>&lt;.0001</b>	<b>-0.35452</b> <b>&lt;.0001</b>	<b>-0.51809</b> <b>&lt;.0001</b>	1	
Internal Financing	-0.00087 0.9793	-0.04545 0.175	0.00673 0.8408	-0.0273 0.4155	<b>0.13787</b> <b>&lt;.0001</b>	-0.03115 0.3527	-0.04585 0.1712	1

Note: For variable definitions, please see Table 2.

Three other variables have significant relationships with the ownership variables. One is the natural log of total assets that is highly correlated with Individual ownership and Nominee ownerships. The direction of these correlations is worth mentioning as it indicates that larger companies have higher Nominee ownerships and smaller companies have higher individual ownerships. These directions, in part, suggest that the management of different sized companies may have different earnings management incentives because of different stockholders structures.

The internal financing variable and the debt-to-equity ratio are also significantly correlated to individual ownership, indicating that companies with a greater proportion of individual owners in Malaysia retain larger amounts of appropriated retained earnings in their firms and rely less on debt financing.

## Results of Analysis

Data is analyzed using Ordinary Least Square (OLS). Each hypothesis is tested in two different ways: by company-year (pooled) and by calendar-year.

### Company-Year Results

Table 4 reports results of the analysis for the company-year of the entire period from 1995 to 1999. The objective of this analysis is to examine the relationship between earnings management (income effect of discretionary accruals) and each independent variable for each individual year as well as the entire period covering 1995 to 1999.

Panel one of the Table reports the regression results for years 1995, 1996, and 1997 (pre-market-crash). Panel two of the Table reports the regression results for years 1998 (the year of the market crash) and 1999. The result of all company-years is also reported in the last columns of Panel two. Below is the description of the results based on the hypotheses developed earlier.

*Debt Covenants:* Contrary to findings in most earnings management studies, the debt-to-equity ratio does not significantly explain earnings management in Malaysia for

Table 4: Results for the Test of Hypotheses for Years 1995 to 1999, and for All Years Pooled

Panel one: Results of the regression for years before the economic downturn.

Variables/year	Year 1995 N = 188		Year 1996 N = 195		Year=1997 N = 197	
	R-Square	0.7190	R-Square	0.0423	R-Square	0.0530
	Adj R-Sq	0.7065	Adj R-Sq	0.0011	Adj R-Sq	0.0127
	Parameter Estimate	Pr >  t	Parameter Estimate	Pr >  t	Parameter Estimate	Pr >  t
Intercept	<b>-1.41E+08</b>	<b>0.0678</b>	<b>1304456864</b>	<b>0.0659</b>	<b>1187222439</b>	<b>0.0296</b>
Debt-to-Equity Ratio	24.56212	0.7355	645.36235	0.9156	198.21324	0.7048
Natural Log of Total Assets	5017098	0.1804	<b>-65152197</b>	<b>0.0528</b>	<b>-58976294</b>	<b>0.0202</b>
Tax Rate	-114172	0.9113	7429106	0.8097	-104768883	0.1396
Internal Financing	<b>735285</b>	<b>&lt;.0001</b>	-2.7169	0.6588	33226122	0.6254
Individuals Ownership	29532799	0.2827	257078040	0.3139	191195696	0.2904
Management Ownership	<b>58381720</b>	<b>0.02</b>	54328402	0.8123	18227219	0.9127
Nominee's Ownership	<b>46736300</b>	<b>0.0434</b>	<b>415515540</b>	<b>0.0376</b>	<b>276965807</b>	<b>0.0604</b>

(Cont.) Table 4: Results for the Test of Hypotheses for Years 1995 to 1999, and for All Years Pooled

Panel two: Results of the regression for 1998 and 1999 and all company-years.

Variables/year	Year 1998 N = 196		Year 1999 N = 116		All Year N = 892	
	R-Square	0.0130	R-Square	0.1291	R-Square	0.0204
	Adj R-Sq	-0.0293	Adj R-Sq	0.0640	Adj R-Sq	0.0116
	Parameter Estimate	Pr >  t	Parameter Estimate	Pr >  t	Parameter Estimate	Pr >  t
Intercept	313396870	0.3292	<b>6.61E+08</b>	<b>0.0013</b>	<b>646380305</b>	<b>0.0015</b>
Debt-to-Equity Ratio	53.90739	0.8938	-200.726	0.9007	70.30364	0.7899
Natural Log of Total Assets	-11853767	0.4242	<b>-3.4E+07</b>	<b>0.0007</b>	<b>-32249505</b>	<b>0.0008</b>
Tax Rate	5534749	0.7966	-5.4E+07	0.2104	-663283	0.9027
Internal Financing	4994082	0.75	36613600	0.1619	-0.98591	0.7899
Individuals Ownership	-133304784	0.219	-4E+07	0.5703	73527579	0.3104
Management Ownership	-80285486	0.4008	58097129	0.366	7329970	0.9105
Nominee's Ownership	-46336842	0.5954	11731589	0.834	<b>159114257</b>	<b>0.0059</b>

Bold items: Significant at 0.07 level.

Note: For variable definitions, please see Table 2.

any of the years in this study. We had predicted that closeness to debt covenants (as measured by the debt-to-equity ratio) would not have a significant effect on earnings management during the economic development of Malaysia in the first part of the 1990s, but we expected that as the economic growth rate declined and the economic recession began, managers of Malaysian companies would become more concerned about the debt market and chose those accruals that would result in higher income. While the results confirm the first part, the later part of our expectation has not materialized<sup>15</sup>. The lack of results may also be due to the assistance that was provided by the Malaysian government in the years following the economic recession through two newly formed companies, Danamodal and Danaharta. These companies helped prevent ailing companies from going into immediate bankruptcy, which may have caused companies to be indifferent about their debt covenants.

*Political Costs:* This study uses the natural log of total assets as a surrogate measure of political sensitivity. Most earnings management studies have indicated that larger firms tend to use income-decreasing accounting methods to avoid political costs. However, as the Malaysian government may be considered friendlier to large businesses and as



these companies have not been as concerned with anti-trust regulation (as their U.S. counterparts), we suggested the possibility that political costs may not have an influence on earnings management in Malaysia. The results in Table 4, however, suggest that managers of larger Malaysian companies, similar to their counterparts in the United States, choose income-decreasing accounting accruals and manage earnings downward in most years (every year but 1995 and 1998). The results indicate that although the Malaysian Government supports larger businesses and may not impose political penalties for larger amounts of earnings, pressures from other political parties (such as employees, costumers, and suppliers) may influence management's decision on reporting lower earnings figures to avoid possible political costs<sup>16</sup>.

*Tax Rate:* This paper suggests that higher tax rates may result in the choices of income-decreasing accruals. The results reported in Table 4 do not support this hypothesis. In part, this may be related to the very low corporate tax rates in Malaysia. As reported earlier, the effective tax rate continued to decrease from 1995 to 1999. Furthermore, the Malaysian government provided additional tax incentives (lower effective rates) after the market crash. As such, there is less reason to see any relationship between the effective tax rate and earnings management in Malaysia. Pourjalali and Hansen (1996) also show that there was no significant effect of tax rates on income accruals for U.S. companies<sup>17</sup>.

*Internal Financing:* Our expectation on the effect of internal financing (measured by the ratio of appropriated retained earnings to total assets) on earnings management was that lower internal financing would result in more choices of income-increasing accounting accruals (managing earnings upward). Except in 1995 (and in opposite direction), there was no significant association between the degree of internal financing and earnings management. It appears that the managers of Malaysian companies are not influenced by the level of appropriated retained earnings in making their earnings management decisions.

Due to the significant degree of correlation between internal financing and individual ownership (see Table 3), it is possible that the effect of internal financing on earnings management is captured by the individual ownership variable. However, as will be mentioned in the next paragraph, we could not find any statistically significant association between earnings management and individual ownership either.

*Ownership variables:* We measured the ownership variables based on four ownership categories: individual ownership, managerial ownership, institutional ownership, and nominee ownership. As we could not obtain the total number of outstanding shares easily and to avoid including large numbers of shares in the model<sup>18</sup>, the total number of outstanding shares was assumed to be the total number of shares in all four categories. To calculate the proportion of shares held by each category of stockholders, we divided the number of shares in each category by the total of number of outstanding shares (calculated, using the assumption mentioned above). This resulted in a linear relationship among the proportions that would be included in the model (they always add to a total of 1 or 100%), which would cause regression errors. To avoid the linearity problem, we dropped institutional ownership from the model and ran the regression without this variable. It was hoped that if there were a significant effect resulting from institutional ownership, the effect would be captured by the Intercept in the regression analysis. We expected that higher degrees of individual and nominee ownerships would result in income-increasing behaviour and higher degrees of management and institutional ownerships would result in income-decreasing behaviour.

The results indicate that nominee ownership has the expected effect on earnings management in years prior to the market crash of 1998 (this variable is also significant for the pooled sample). Management ownership has a significant effect in 1995, however, the sign is opposite to expectations. No other ownership variables show a significant effect on companies' earnings management. Interestingly, the intercept is significant in all regression analysis (other than 1998)<sup>19</sup>. Overall, it appears that there is some degree of ownership effect on the choices of accounting accruals in Malaysia during the years 1995 to 1999.

*The 1997-1998 Financial Crisis:* One of the most interesting findings of this study is that in 1998 all of the traditional and ownership independent variables seem to have lost their ability to explain earnings management. It appears that a combination of the drop in Ringgit (Malaysian currency) and major changes in the economic environment affected the incentives for earnings management in periods during, and to some extent after, the financial crisis<sup>20</sup>. The findings in 1998 may be attributable to the bubble of the economic crisis and may suggest that the Malaysian managers did not have a clear picture of the economy during this year. Consequently, a detectable pattern for earnings management can not be found.

## Summary, Discussion and Conclusion

Although Malaysia had the largest debt market and equity market in ASEAN around the mid-90s (OECD, 1999), studies of earnings management in Malaysian companies are scarce. This study uses a sample of companies listed on the Kuala Lumpur Stock Exchange (KLSE) to examine earnings management in Malaysian companies for the years 1995 to 1999. The dependent variable in this study is a discretionary accrual variable. This amount is calculated using a model that incorporates changes in the discretionary accounting accruals without employing the accounting method directly. Traditional explanatory variables for earnings management (such as size and debt-to-equity ratio), tax rate, internal financing, and ownership variables were included in the model to explain the choices of accounting accruals (or earnings management) in Malaysia. Since the economic downturn (1997) and market crash (1998) years are included in the sample years, we are also able to evaluate their effect on earnings management. This study finds at least two factors affecting choice of accounting accruals; size of the company (measured in natural log of total assets), and nominee ownership. The results suggest that managers choose income-increasing accounting accruals to improve the financial picture portrayed by the financial statements to attract investment from security brokers and investment trusts. These groups (called nominees in this paper) hold over 25% of the outstanding shares of public companies in Malaysia. This income-increasing behavior remains consistent both before and after the economic crisis in Malaysia.

The size of the companies also affects earnings management in Malaysia. The larger the firm, the more likely it will choose income-decreasing accounting accruals (downward earnings management). This result is similar to the findings of studies that concentrate on U.S. companies. Debt-to-equity ratio, effective tax rate, and internal financing do not have a significant effect on earnings management in Malaysian companies. No explanatory variable is significant during the market crash year, 1998, suggesting that during the

market crash managers did not choose a systematic earnings management policy that could be detected by the regression model.

The lack of results for some of the hypotheses developed in this paper may, in part, have originated from the differences in the corporate financing in Malaysia. Most large Malaysian companies are supported by the government through Danaharta and Danamodal. This financial system has created a credit-based business environment that is heavily dependent on banks to finance corporate financial needs (Aman and Desa, 1998). Banks in Malaysia have become the dominant source of debt financing as their share of domestic debt increased from 62% in 1986 to 75% in 1997. Over the same period, the debt market from public sources (bonds, etc.) decreased from 38% to 25%. It has been argued that the close relationship between government, business and finance has led to high debt-to-equity ratios in the corporate sector (Mahbob and Govindan, 2000). Contrary to cases in the U.S., this increase in the debt-to-equity ratio does not suggest that the firms are close to debt covenants or under financial pressures of the debt holders. This may be a peculiar feature of the Malaysian financial system which differs from the environment in other countries such as Japan or the U.S.

Although this study has data limitations<sup>21</sup>, the results contribute to the existing literature on international earnings management. Our findings shed light on some of the reasons that Malaysian firms manage earnings. In addition, it supports the notion that the reasons for earnings management may differ from one nation to another. An extension of this study can provide additional evidence on earnings management after the 1998 market crash as the results may not be generalizable to the period subsequent to 1988 after the Malaysia government introduced a new regulatory environment. The new study may provide different results as the Malaysian economic environment has changed substantially after 1998 (new government policies, changes in the accounting authorities and so on). This study can also be extended to include detailed information for other relevant factors such as equity ownership by foreign investors, management bonus plans, and corporate governance<sup>22</sup>.

## Notes

<sup>1</sup> Some of the changes as a result of the economic crises in 1997 and 1998 were establishments and modification of regulatory bodies such as:

- Malaysian Accounting Standards Board (MASB). MASB was established under the Financial Reporting Act 1997 as an independent authority to develop and issue accounting and financial reporting standards in Malaysia.
- Companies Commission of Malaysia (CCM). A division under the Ministry of Domestic Trade and Consumer Affairs established on April 2002.
- Bursa Malaysia (previously Kuala Lumpur Stock Exchange). A self-regulatory organization which governs the conduct of its members and member stockbroking companies in securities dealings; it enforces the listing requirements which spell out the listing and disclosure standards to be maintained by public listed companies; and which is also responsible for the surveillance of the market place.

For additional information, please see [http://www.micpa.com.my/public/related\\_link.asp](http://www.micpa.com.my/public/related_link.asp)

- <sup>2</sup> Very few studies have considered including ownership type as a possible explanatory variable for accounting, accrual choices.
- <sup>3</sup> International accounting methods and standards have been developing through organizations such as the International Accounting Standards Board (IASB), International Auditing and Assurance Standards Board (IAASB), the International Organization of Securities Commissions (IOSCO), the European Union (EU), and the Association of Southeast Asian Nations (ASEAN).
- <sup>4</sup> For example, variables such as those related to information about management bonus contracts, industry effect, and the degree of closeness-to-debt–covenant-violation were excluded in this study as we did not have relevant data.
- <sup>5</sup> Our data base did not include information for deferred taxes (or tax prepayments); as such the effect of these items on the choices of accounting accruals are not reported in this study. It is possible that such items provide different incentives in earnings management for companies. For example, when the amount of deferred taxes are substantial, the management may have a higher incentive to defer earnings to avoid a large cash outflow for taxes. A similar argument (and in opposite direction) can be hold for cases of tax prepayments.
- <sup>6</sup> These categories are (1) management-controlled companies with dispersed shareholding; (2) shareholder-controlled companies where the controlling shareholder has a direct majority stake with control rights more closely aligned with cash flow rights; (3) shareholder-controlled companies where the controlling shareholder has a direct but a substantial minority stake with his control rights aligned with his cash flow rights (probably to a less extent than the category 2 companies); and (4) shareholder-controlled companies where the controlling shareholder has only an indirect stake.
- <sup>7</sup> Individual investors in the U.S. hold an average of 49 per cent of total outstanding shares.
- <sup>8</sup> World Trade Organization (WTO) reports that during the 1992-1996 period, 40% of Malaysian GDP was through additional investments. Investment was encouraged by tax and non-tax incentives. See [http://www.wto.org/english/tratop\\_e/tpr\\_e/tp67\\_e.htm](http://www.wto.org/english/tratop_e/tpr_e/tp67_e.htm) for further explanation.
- <sup>9</sup> International Trade and Finance: Current Trends and Difficulties. By Wong Sau Ngan, Reported at <http://www.mlj.com.my/free/articles/wongsn.htm#1>
- <sup>10</sup> The study is focused only on the companies listed on the main board hence those listed on the second board are not included in the sample. The sample does not distinguish companies with financial difficulties from those having sound financial standing.
- <sup>11</sup> The dependent variable model in this study uses information in the five years prior to the estimation date.
- <sup>12</sup> The PN4 companies were introduced in 2001, which is not within the period of the study. PN4 companies received KLSE revamped listing conditions. Essential conditions forced listed companies to, within a given time frame, restructure and meet adequate financial conditions in order for them to be allowed to continue trading on the exchange.
- <sup>13</sup> What is not evident in Table 2 is that the total debt-to-equity ratio increases during the period 1995 to 1997 and declines in 1998 (market crash year). However, the ratio

increases significantly in 1999. Overall, the debt-to-equity ratio increases over the period from 1995 to 1999 among the KLSE listed companies. Similarly, there was a steady increase in total assets of the company from RM1.33 billion in 1995 to RM2.0 billion in 1999. An analysis of the data reveals that the tax rate has decreased gradually from 1995 to 1999 to the level of 0.03%. This drastic decrease may be due to the transition of the government tax policy which resulted in tax exemptions on income earned in 1999.

<sup>14</sup> We are unable to test this hypothesis, however, as the number of companies within each industry is not large enough to make a definite conclusion.

<sup>15</sup> It is possible that the effect would be reflected in years after 1999. Consequently, additional studies are warranted here to address such possibility.

<sup>16</sup> We did not have information about the political affiliation of companies included in our sample. It is possible that the political affiliation provides different earnings management incentives. Although one can suggest that the inclusion of ownership variable may capture political affiliation effects, a more direct study of the effect of political affiliation on earnings management is warranted.

<sup>17</sup> This result is different from evidence provided in Adhikari, et. al (2005). The mentioned study provided evidence that, for selected large with low effective tax rate companies, earnings management took place in response to anticipated changes in tax policy. The lack of results in our study can be attributed to our inclusion of all companies in the sample (instead of selected companies). Furthermore, this study does not directly test for a change in tax policy or rate.

<sup>18</sup> If we include the total number of shares, the results will be substantially affected by the magnitude of the number of shares, which is larger when the company is larger, and will be difficult to interpret the effect.

<sup>19</sup> This significance may be, in part, a result of capturing the effect of institutional ownership on earnings management. Since the direction of the intercept is not consistent, this interpretation is questionable

<sup>20</sup> The test results for 1999 reveal that the nominee's ownership effect is no longer a significant variable in explaining earnings management. However, the size variable continues to be significant. The lack of result for nominee ownership may be attributable to several factors; change in government regulation, increase in the amount of internal financing, and government tax incentives after the financial crisis.

<sup>21</sup> See footnote 4 for further explanation.

<sup>22</sup> For example, Saleh, Rahmat and Iskandar (2005) and Saleh, Iskandar and Rahmat (2005) find the presence of board members with multiple directorship experience, and financially literate and independent audit committee members improve the effectiveness of detecting earnings management.

<sup>23</sup> FRS 108 requires that the current (or catch-up) approach be employed to account for changes in accounting principles. The cumulative effect of the adjustment should be reported in the income statement, (Malaysian Standard Board publication: [http://www.masb.org.my/masbstd\\_aas01.htm](http://www.masb.org.my/masbstd_aas01.htm)).

<sup>24</sup> It is possible that managers can manipulate variable cash expenses as well. If the variable cash expense ratio is not constant because of manipulative behavior, then the change in the total cost ratio will also pick up this manipulation—an outcome that is obviously desirable.

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## APPENDIX 1

### Model Used to Estimate Earnings Management (Choices of Accounting Accruals)

The accounting choice variable should measure the income effect of all discretionary choices made by a manager for a given period. Let  $A_t$  be the total income effect of the discretionary choices for period  $t$ . Since discretionary choices can affect revenues, variable expenses, and fixed expenses,  $A_t$  can be expressed as the sum of three discretionary sub-components:

$$A_t = A_{rt} + A_{vt} + A_{ft}$$

where

$A_{rt}$  = the discretionary revenue effect

$A_{vt}$  = the discretionary variable accrual effect

$A_{ft}$  = the discretionary fixed accrual effect

Assessing each sub-component's effect provides a measure for the total discretionary effect. The following assumptions are needed to build the desired measurement model:

1. *Receivables Assumption.* The ratio of true accounts receivable to true sales revenues can be measured using the average prior period balances for these accounts; also, the ending accounts receivable balance is correctly stated for period  $t$ . "True" is defined as the amount that would be reported without manipulative changes.
2. *Cost Behavior Assumption.* Cost behavior can be described as a linear function of reported revenues. This function can be measured using the average prior period balances for costs (operating expenses) and sales revenues.
3. *Fixed Expense Assumption.* The only significant fixed expenses are depreciation and amortization. Furthermore, APB Opinion 20 is operative<sup>23</sup>.

Assessing the Discretionary Revenue Effect. The Receivable assumption suggests that a true ratio for accounts receivable to revenues exists. This ratio can be found using the following:

$$K = AR_{(t-n \text{ to } t-1)} / R_{(t-n \text{ to } t-1)}$$

Where:

$n$  is an arbitrary length of time that is long enough to calculate the actual (unmanipulated) ratios. This time period usually varies from 5 to 10 years (periods).

$t$  is the year under study. Then  $t-1$  is the year before the year under study and so on.

$K$  is the firm's normal accounts receivable to revenues ratio (averaged from  $t-n$  to  $t-1$ ).

$R_{(t-n \text{ to } t-1)}$  is the firm's total revenue from  $t-n$  to  $t-1$ .

$AR_{(t-n \text{ to } t-1)}$  is the firm's total accounts receivable from  $t-n$  to  $t-1$ .

Assuming that management has manipulated the revenue in period  $t$ , the accounts receivable to sales revenue ratio for  $t$  ( $K_{(t)} = AR_{(t)} / R_{(t)}$ ) is not equal to  $K$ . Thus, using the receivables assumption and the calculated receivables factor,  $K$ , the true (nonmanipulated) revenues,  $R_{Tt}$ , can be computed:

$$\Delta K = K - K_{(t)}$$

$$R_{Tt} = (AR_t * \Delta K + R_t)$$

Given  $R_{Tt}$ , the revenues manipulated in period  $t$ ,  $R_{dt}$ , can be computed:

$$R_{dt} = R_t - R_{Tt}$$

The total variable cost ratio is the difference between the total expenses and fixed expenses (i.e., the depreciation and amortization expenses), divided by reported revenues:

$$b_t = (E_t - F_t) / R_t$$

where

$E_t$  = total reported operating expenses

$F_t$  = Depreciation + Amortization (by the fixed expense assumption)

Finally, the income effect of manipulated revenues for period  $t$  can be calculated using  $R_{dt}$  and  $b_t$ :

$$A_{rt} = (R_{dt})(1 - b_t)$$

Assessing the Variable Accrual Effect. By the Cost Behavior assumption, the average variable accrued cost ratio of periods  $t-n$  to  $t-1$  can serve as the benchmark for assessing discretionary changes in variable accrued expenses in period  $t$ . Essentially, the change in the average variable accrued expense ratio for periods  $t-n$  to  $t-1$  to period  $t$  signals a discretionary change that belongs only to period  $t$ . Thus, the income effect is simply the change in ratio multiplied by the true revenues of period  $t$ . The income effect of manipulating variable accrued expenses is computed as follows<sup>24</sup>.

$$A_{vt} = (b_{(t-n \text{ to } t-1)} - b_t)R_{Tt}$$

Note that if  $(b_{(t-n \text{ to } t-1)} - b_t) > 0$ , then income-increasing behavior is signaled. The opposite is signaled if  $(b_{(t-n \text{ to } t-1)} - b_t) < 0$ .

Assessing the Fixed Accrual Effect Assessment of the fixed accrual effect relies on the fixed expense assumption. By this assumption, the only significant fixed accrued expenses are depreciation and amortization. Any changes in assessing these expenses and their effects on income must be disclosed. Since changes in accounting practices do not result from changes in a firm's underlying economic situations, all income effects of changes in the accounting practices are assumed manipulative. This amount is found by inspecting the income statement for period  $t$ .