

CHAPTER 3

METHODOLOGY AND METHODS

3.1 Introduction

This chapter briefly outlines the theory underlying the formulation of hypotheses based on the accounting literature reviewed in Chapter Two and develops the hypotheses to be tested. Subsequent sections provide description of the sample selection, data collection procedures, variable measurement, and the method employed to test the hypotheses.

3.2 Hypothesis Development

To accomplish the objectives of the study mentioned in Chapter One, seven hypotheses have been developed.

3.2.1 The Corporate Profitability Hypothesis

There has been considerable empirical support for existence of a link between environmental disclosure and financial performance.

Hence the first hypothesis is:

H_{1Profitability}: There is significance difference in the financial performance of the company and the extent of environmental disclosures.

3.2.2 The Size Hypothesis

Various theories suggest positive relationship between firm size and environmental disclosures. Hence the second hypotheses is:

H_{2Size}: There is significance difference between the company size and the extent of environmental disclosures.

3.2.3 The Financial Leverage Hypothesis

Creditors control access to financial resources that may be essential for continued operation of a corporation. The greater the company depends on debt financing, the greater the degree to which corporate management would expect to respond to the creditor expectations concerning the

corporations role in social responsibility activities (Ullman 1985). Under the assumption that creditors exhibit serious concern about the social and environmental responsibility of Malaysian companies have a positive relationship with the level of corporate social and environmental disclosure.

Hence the third hypotheses is:

H_{3Leverage}: There is significance difference between the financial leverage of the company and the extent of environmental disclosures.

3.2.4 The Proportion of Assets in Place Hypothesis

The proportion of assets in place hypotheses is developed based on the study of Myres (1977) who considers the value of firm as comprises to two components, namely assets in place and growth opportunities.

Hence the fourth hypotheses is:

H_{4Assets-in-place}: There is significance difference between the proportion of assets-in-place and the extent of environmental disclosures.

3.2.5 The Auditor Hypothesis

The auditor hypothesis is developed based on the study by Hossain and Adams (1995) who reported that the type of audit firm is likely to be positively related to the overall level of information voluntarily disclosed by firms. Hence the fifth hypothesis is:

H_{5Auditor}: There is significance difference between the type of audit firm employed and the extent of environmental disclosures.

3.2.6 Ownership Diffusion hypothesis

A stakeholder is defined as any group or individual who can affect or is affected by the achievement of the firm's objective (Freeman 1984). Stakeholders of the firm include stockholders, creditors. Employees, customers, suppliers, public interest groups and governmental bodies. The stakeholder theory as initiated by Ansoff (1965) contends that the major objective of the firm is to attain the ability to balance the conflicting demands of various stakeholders in the firm, a dynamic implication of which had been

further developed by Freeman (1983). Ullman (1985) proposed a conceptual model for studying corporate social responsibility activities in a stakeholder framework, concluding that stakeholder theory provides an appropriate justification for incorporating strategic decision making into studies of corporate social responsibility activities. Based on the stakeholder theory, one could argue that if social responsibility activities is part of a strategic plan for managing stakeholder relationship.

Keim (1978) argues that as the distribution of ownership of a corporation becomes less concentrated the demands placed on the corporation by shareowners becomes broader. Disperse corporate ownership, especially by investors concerned with corporate social activities increases pressure for management to disclose corporate ownership, the better the corporation's social responsibility disclosures.

Hence the sixth hypotheses is:

H_{6Ownership}: There is significance difference between companies with widely held shareholding and the extent of environmental disclosures.

3.2.7 Industry Membership

Several empirical studies have found positive association between industry classification and corporate social disclosure. Consumer oriented companies can be expected to exhibit greater concern with demonstrating their social responsibility to the community, since this is likely to enhance corporate image and influence sales (Cowen *et. al*, 1987). Patten (1991) argues that industry influence political visibility and this drives disclosures to ward off undue pressure and criticism from social activists.

Hence the seventh hypotheses is:

H_{7Industry}: The tendency to disclose environmental information is associated with industrial membership.

3.3 Sample Design and Data Collection

This study is divided into two main areas of environmental reporting which are the quantity of reporting and the quality of reporting.

3.3.1 Determinants of Voluntary Disclosures

This study seeks to investigate the relationship between environmental disclosure and the firm specific characteristics such as profitability, firm size, financial leverage, assets-in-place, auditors, ownership diffusion and industry. The annual reports for the year 2000 from the "top" 250 companies listed on the Kuala Lumpur Stock Exchange which represents 90% of market capitalization were selected for this study. The "top" 250 companies are based on a size ranking of market capitalization as in Guthrie and Parker (1990) and Hackstone and Milne (1996) and therefore provide data for the international comparisons. The 90% market capitalization figure is comparable with 92% of Australian share market included in Hackston and Milne (1996) study and 90% included in Guthrie's (1990) study.

The annual reports for the year 2000 of the top 250 companies were analyzed. Out of the 250, 4 financial institutions were excluded from the sample as they have merged with other financial institutions and 3 other companies whose shares were suspended from trading were also excluded from this sample. Hence the sample was increased to 257 by including 14 randomly selected companies (2 from each industry).

3.4 Dependent Variables

Content analysis is used to measure environmental disclosure. In one form the method is adopted from previous studies Ernst & Ernst, 1978 and Gray *et. al.*, 1995.

Studies on social and environmental disclosure (Guthrie and Mathews 1985; Guthrie and Parker 1990, Hackston and Milne 1996, Tsang 1998) used content analysis to analyze annual reports. The information collected will be based on quality, quantity and type of reporting. The quality of reporting is assessed using two indicators. The first indicator is based on the categories of specific environmental issues (Teoh *et al.* 1998) and the other indicator will be

the location of environmental information in annual reports (Unnerman 1996). The quantity of environmental information is calculated base on number of pages that contain the information and type of reporting is based on whether in information reported is monetary, non-monetary or general nature (Table 2). The type of information will also be identified whether it is positive or negative type of news.

This categorization enables the researcher to capture the comprehensiveness of the environmental information reported. The themes are analyzed and given score based on the three types of reporting. The five broad themes use in this study is statement of environmental policy, financial data, product and service related, sustainability activities and audit (Gray *et al.* 1995).

Type of information	Score
Environment information quantitative and monetary reported	3
Quantitative information reported with non monetary	2
General information	1

Table 2: Type of Reporting

The total score of environmental information reported in annual reports based on the themes of reporting are calculated as:

$$\text{Total score for one location} = \sum_{i=1}^k (\text{theme score})^1$$

where, k=number of themes

The second indicator will be the location of environmental information in annual reports (Unnerman 1996). Different reporting location are given different quality of weight as certain locations are more likely to be read, audited or indicates the importance attached to the issue being reported (Gray *et al.* 1995). Reporting in financial statements is given higher weight since it is audited, objective, relevant and material. Reporting in separate Environment Policy statement is given higher weight since it is important issue to the company. Reporting in the Review of the Operation section and the Yearly

Event section are given lower weight because it is perceived the information is less important and the reporting involve a lot of subjectivity (Gray *et al.* 1995) (see Table 3).

The weight given for the different location is as follows: -

Location		Weight
1	Environmental Policy Statements	4
2	Vision/Mission/Strategy Statements	4
3	Front Page	3
4	Chairman's Statements	2
5	Social Responsibility Statements	2
6	Yearly Calendar /Events	1
7	Review of Operations	1

Table 3: Weight for Different Reporting Location

Environmental information can be found in many locations in the annual report. Since quality of the reporting is calculated based on the location and themes of reporting, the total score will be the combination scores from different locations in annual report. The total score is calculated as follows: -

$$\text{Total score if quality reporting} = \sum_{J=1}^m (\text{weight of location } i \times \text{total score themes})$$

Where, m= the number of locations in annual report that have environmental information.

Quantity of reporting is measured based on the number of pages used to report environmental information in annual reports (Deegan and Rankin, 1996). The recent trend of reporting in the Annual reports shows that more and more organizations are using pictures and graphs and charts. This measurement scheme enables figures, charts, graphs and pictures to be included in the analysis. Pictures and graphs can be easily read and are considered as better communications tools compare to sentences or words.

Words are sometimes very technical and difficult to understand. Therefore, for measuring quantity of reporting based on number of pages is considered more relevant to using number of words or sentences.

Following the procedures suggested by Gray *et. al.*, (1995) and also used by Hackston and Milner (1996) to measure using number of pages, gridlines were used to measure. A standard A4 size plastic sheet is divided into 100 unit using gridlines of 10x10. Page margin for this sheet is fixed at 2.5 cm all around, top, bottom, left and right. Each unit represents 1% (1/100) of pages from reporting page. The plastic sheet is placed over a body of text to measure the number of units of reported information.

For the purpose of comparison for the quantity of information reported, this study will also use the number of sentences method to measure the quantity of environmental disclosure. Absolute number of sentences with regards to any environmental information mentioned which satisfies the criteria above would be considered. Any repetition of the same information will also be considered. Measuring the amount of environmental disclosures by the number of sentences would overcome the limitation of number of pages and remove the need to account for, or standardize the number of words (Hackston and Milne, 1996,).

In both measures of environmental disclosure, no attempt is made to standardize for annual report. There is no restriction on the type of fonts used (big or small) for reporting and the number of pages an annual report can include, if companies consider additional disclosure is sufficiently important, it is believed they will include extra pages in the report.

Environmental information in annual reports is also analyzed based on the type of environment information reported: positive, negative or neutral information. This study will divide the information into positive or negative information only as defined by Gray *et.al.*,1995:

Positive (good): Statements beyond the minimum which include specific details where these details have a creditable or neutral reflection on the company: any statements which reflect credit in the company; upbeat analysis/discussion/statements.

Negative (bad): Statements which reflects/might reflect discredit on the company.

3.5 Independent Variables

As discussed in the previous chapter there are a few variables have been studied that can influence the voluntary disclosure in general. Due to time and cost factors in relation to data collection, the number of variables examined in this study was limited to seven. The seven variables are firm size, financial leverage, assets-in-place, profitability, ownership diffusion, industry membership and the type of audit firm employed. The size and industry variables were selected following the prior research by Hackston and Milne (1996) as these two variables have produced mixed results in other corporate environmental reporting studies. The other remaining variables were selected as they were commonly used in the study of voluntary reporting (for example, see Buzby, 1979; Firth, 1979). Perhaps, the study of these variables in Malaysian context will provide some new evidence with regards to the potential determinants of the amount of environmental disclosures.

The size and industry membership variables were selected following previous research by Hossain and Adam (1995) who found an association between compliance with segment data disclosure and industry membership, but not for firm size. Next, as financial leverage variable has been derived from the work of Susela and Veerinderjeet (1992)¹.

The decision to test the type of audit firm and assets-in-place was selected following Hossain and Adams (1995), it was chosen here to be tested in the Malaysian context for environmental disclosure.

Hackston and Milne (1996) used market capitalization as a proxy for firm size (Size). The size variable in the present study is measured by market capitalization following Tan and Ngan (1991) hence, large companies (those with market capitalization that exceeds RM100 million) are represented by a dummy variable of 1, and 0 otherwise. In addition, listing status (Listing) is

¹ Although the study was conducted on the disclosure of segmental information, the author is of the opinion that this variable may be a potential determinant of environmental disclosure amount.

also used as an alternative specification of the size hypothesis. Similarly, companies listed on the main board of the KLSE are coded 1, and 0 otherwise.

Measures used to test the financial leverage (Leverage) hypothesis were varied across previous overseas studies. Some of it includes book value of debt divided by market value of total assets (Bradbury, 1992); book value of debt plus contingent liabilities divided by total tangible assets (McKinnon and Dalimunthe (1993); and book value of debt divided by market value of total assets (Mitchell *et al.*, 1995). An unpublished report by Susela (1998) reveals that the overall debt-equity ratio for Malaysian listed companies is 66.7% and is measured by the book value of total debt including provisions for liabilities and charges divided by total shareholders' funds (total net assets). Hence, following Susela (1998), the dividing line between high and low-levered firms is set at 66.7%. Accordingly, Leverage is represented by a dummy variable of 1 for companies with high financial leverage, and 0 for companies with low leverage.

As for the type of the audit firm, a dichotomous variable of 1 and 0 is used to distinguish between companies that employ a big-five audit firm as opposed to companies that do not, following the study by Hossain and Adams (1995). Big-five audit firm includes Andersen, Ernst & Young, KPMG Peat Marwick, and Price Waterhouse Coopers, and non big-five will be the other firms.

Next, the development of the industry membership hypothesis is based on Hackston and Milne (1996) that classified companies following the New Zealand Stock Exchange (NZSE). Hence, this study will classify the companies into sectors as per KLSE listing. However, due to some small observations in certain sectors they have combined closely related sectors, the sampled companies are disaggregated into industry membership according to the sectors they were listed on the KLSE and certain related sectors are also combined for simplicity reason. Consequently, the final classifications are reduced to seven sectors. They are Consumer Product,

Industrial Product, Construction/Infrastructure Project Companies, Trading & Services/Technology, Finance, Property/Hotel, and Plantation/Mining.

The assets-in-place hypothesis is based on Chow and Wong-Boren (1987), and Hossain and Adam (1995) that is represented by the ratio of book value of fixed assets (net of depreciation) to the book value of total assets.

The ownership distribution hypotheses is measures by the number of shareholders is natural logarithm of number of shareholders as reported.

3.6 Statistical Tests

The study used both univariate and multivariate tests to examine the hypotheses. The univariate test was a conducted to examine whether independent variables had influence on the environmental disclosure. In addition, a cross tabulation was carried out between the dependent and independent variable. A dichotomous dummy variable, which identifies disclosing firms as 1 and non-disclosing firms as 0, was used for the dependent variable.

A logistic regression analysis was used for the multivariate test. The multivariate test approach was used to supplement the univariate test and provide an appropriate means of considering the simultaneous effect of the independent variables on the environmental disclosure. The Spearman's correlations were also undertaken to examine the correlations between variables and to ascertain the presence of multicollinearity

The computer software, Statistical Package for Social Sciences (SPSS) has been used to facilitate the analysis process.

3.7 Variable Measurement

In the previous study by Tan and Ngan (1991), market capitalisation was used as a surrogate for firm size (Size) and the dividing line between large and small firms was set at RM100 million. Therefore for the present study, the size variable is measured by market capitalization as Tan and Ngan study (1991). Large companies (market capitalisation exceeds RM100 million) are represented by a dummy variable of 1, and 0 otherwise.

In addition listing status (Listing) is also used as an alternative specification of the size hypotheses. Companies listed on the main board are coded 1, and 0 otherwise.

Measures used to test the financial leverage (Leverage) hypothesis were varied across previous studies. Susela (1998) reveals the overall debt-equity ratio for Malaysian listed companies is 66.7%. It is measured by book value of total debt including provision for liabilities and charges divided by total shareholders fund (total net assets). Therefore for this study we would use this measure following Susela (1998) as 66.7% being the dividing line between high and low levered firms. Leverage is represented by dummy variable 1 for companies with high financial leverage, and 0 for low leverage companies.

For the auditors variable, this study would use as Hossain and Adams (1995) study, a dichotomous variable 1 and 0 is used to distinguish between companies that employ big-five firm as opposed to companies that do not. The big-five firms are Anderson, Ernst & Young, KPMG Peat Marwick, and Price Waterhouse Coopers, the non-big-five refers to any other audit firm.

The industry membership hypothesis is based on Tan and Ngan's (1991) classification into sectors as per the Kuala Lumpur Stock Exchange listing. Some of the closely related sectors were combined and the final classifications were reduced to seven, which are Consumer Products, Industrial Product, Construction/Infrastructure Project Companies, Trading and Services, Finance, Property/Hotel, and Plantation/Mining.

The assets-in-place hypothesis is based on Chow and Wong-Boren (1987), and Hossain and Adam (1995) that is represented by the ratio of book value of fixed assets (net of depreciation) to the book value of total assets.

The ownership distribution hypotheses is measured by the number of shareholders is natural logarithm of number of shareholders as reported.

3.7 Conclusion

This chapter justifies the methodological framework adopted in this study. The next chapter will present and discuss the results of the statistical tests described in this chapter.