

CHAPTER 3

METHODOLOGY AND METHODS

3.1 Introduction

This chapter will explain briefly the theory underlying the formulation of the hypotheses to be tested. It also provides a description of the sample selection, data collection procedures, variable measurement and the method employed to test the hypotheses.

3.2 Hypotheses Development

To accomplish the objectives of this study as outlined in Chapter One, five sets of null and alternate hypotheses have been developed.

3.2.1 The Size Hypothesis

Agency theory, signaling theory and cost benefit analysis all indicate that there may be a positive relationship between the firm's size and disclosure. Many empirical disclosure studies have tested positive the size hypothesis and in most cases size has been found to be a significant explanatory variable [Chow and Wong-Boren (1982) Lang and Lundholm (1993), Ashbaugh *et al.* (1999), Ettredge, (2000a)]. Hence the hypothesis is:

H_{0size}: There is no significant difference between the company size and the extent of financial disclosure on the Internet.

H_{1size}: There is significant difference between the company size and the extent of financial disclosure on the Internet.

In addition, listing status is also used as an alternative specification of the size hypothesis. As this type of listing status is only peculiar to Malaysia, no previous overseas studies could be quoted as reference. However a recent study by Chow (2001) reports significant relationship between disclosure of segmental information and listing status. The size hypothesis is therefore restated as follows:

H_{0listing}: There is no significant difference between the listing status of the company and the extent of financial disclosure on the Internet.

H_{1listing}: There is significant difference between the listing status of the company and the extent of financial disclosure on the Internet.

3.2.2 The Financial Leverage Hypothesis

Jensen and Meckling (1976) suggest positive association between financial leverage and voluntary financial disclosure. Empirical studies of Schipper (1981) and Bradbury (1992) tested positive relationship between leverage and voluntary financial disclosure. However, Chow and Wong-Boren (1987) and Hossain and Adams (1995) reported no significant relationship. To examine whether financial leverage is a predictor of voluntary financial disclosures at the Internet, the second hypotheses are stated as follows:

H_{0Leverage}: There is no significant difference between the financial leverage of the company and the extent of financial disclosure on the Internet.

H_{1Leverage}: There is significant difference between the financial leverage of the company and the extent of financial disclosure on the Internet.

3.2.3 The Proportion of Assets-in-Place Hypothesis

The assets-in-place hypothesis is developed based on the study of Myers (1977) who considers the value of a firm as comprises of two components, namely assets-in-place and growth opportunities. Myers (1977) believes firms with low level of assets-in-place (i.e. high level of growth opportunities), are more likely to use equity to finance their growth opportunities. Hence in order to reduce the incentive conflicts between managers and shareholders is to increase disclosure about corporate performance. Conversely, firms with high level of assets-in-place, are likely to be high leverage, could use debt covenants to restrict the managerial discretion over the use of firm's resources. Hence reduce to the need to for extensive financial information disclosed. In summary, voluntary financial disclosure is inversely related to assets-in-place.

However, empirical studies by Leftwich (1981), Chow and Wong-Boren (1987) and Bradbury (1992) do not support this notion. To test empirically the relation between voluntary disclosure and assets-in-place, the third hypothesis is as follows:

H_{0assets-in-place}: There is no significant difference between the proportion of assets-in-place and the extent of financial disclosure on the Internet.

H_{1assets-in-place}: There is significant difference between the proportion of assets-in-place and the extent of financial disclosure on the Internet.

3.2.4 The Auditor Hypothesis

Auditors serve as a primary mechanism for controlling the conflict between the principal and agents (Watt and Zimmerman 1986). Singhvi and Desai (1971), Firth (1979) and DeAngelo (1981) propose that larger and well known auditors is related to higher quality audit services and encourage their clients to disclose financial information voluntarily. Empirical evidence such as Singhvi and Desai (1971), Craswell and Taylor (1992) and Hossain and Adams (1995) found positive relationship between audit firm and financial disclosure. However Firth (1979) does not find the significant association between these two variables. To test empirically the influence of audit firm on the voluntary disclosures of KLSE listed companies, the fourth hypothesis is as follows:

H_{0auditor}: There is no significant difference between the size of the audit firm and the extent of financial disclosure on the Internet.

H_{1auditor}: There is significant difference between the size of the audit firm and the extent of financial disclosure on the Internet.

3.2.5 The Number of Shareholders Hypothesis

One of the potential benefits of dissemination of financial information via Internet is that it can reach a broader audience [Deller *et al.* (1998), Ashbaugh *et al.* (1999), Ettredge *et al.* (2000b)]. Ettredge *et al.* (2000b) revealed that companies with higher level of private ownership tend to provide more benefit related information. Hence, one might expect that firms engaged in Internet reporting to have larger portion of their shares held by individual investors relative to firms that are not disclosing financial information through web sites. Therefore the fifth hypothesis is:

H_{0shareholder}: There is no significant difference between the number of shareholders of the company and the extent of financial disclosure on the Internet.

H_{1shareholder}: There is significant difference between the number of shareholders leverage of the company and the extent of financial disclosure on the Internet.

3.3 Sample Design and Data Collection

The study is basically divided into two main areas, namely the descriptive study on Web based financial and business reporting and the determinants of voluntary financial disclosure over the Internet. The purpose of the second part analysis is to ascertain whether the differences in Web sites are associated with the various firm characteristics such as the size, financial leverage, proportion of assets-in-place, type of audit firm and number of shareholders.

3.3.1 Sample Design and Data Collection – Top 100 KLSE Companies

The companies covered by this study were selected based on the market capitalisation as at 31 December 2000. For the descriptive statistics analysis, top 100 KLSE companies were used. This sample was used to find out if these companies used their Web sites on the Internet to disclose financial information. Further studies were conducted to assess the content of the selected companies home page. Of the 100 companies, 3 financial institutions were excluded from the sample because they have merged with other financial institution. Hence a final total of 97 companies were used for this purpose. As an initial step, an online search was performed on the World Wide Web through KLSE home page. KLSE home page has a link to all listed companies as well as link to their Web sites. In the event the Web address is not found, then attempts are made via the search portal, Lycos Asia (<http://my.lycosasia.com>) to locate for the homepage of that firm.

For the purpose of this descriptive study of the top 100 companies listed at KLSE, types of information are classified into two categories, namely non-financial information and financial information. Non-financial information comprises of the corporate profile⁸, corporate information⁹, corporate

⁸ Corporate profile refers to the corporate background, vision, mission and objectives.

⁹ Corporate information refers to the board of directors, secretaries, registered office, principal bankers, registrar, auditor, solicitor and stock exchange listing.

structure, corporate announcement¹⁰, online share price and historical share price. Financial information category comprises of annual reports, quarterly reports and financial highlights. For this category, similar approach to that of Ashbaugh *et al.* (1999) is used to classify whether a firm is involve in Internet financial reporting or not. A firm is involved in Internet financial reporting if the annual reports or quarterly report is directly from the firm's Web site or through a link to those reports elsewhere on the Internet.

3.3.2 Sample Design and Data Collection – Determinants of Voluntary Disclosure

Second part of the study seeks to investigate the relationship between voluntary financial disclosure at Internet and the firm specific characteristics such as firm size, financial leverage, assets-in-place, auditors and number of shareholders. For this study, the sample size is increase to include (a) all companies that maintain Web site address at KLSE home page. At the time of investigation, there are 278 companies having link pages from KLSE to their Web sites (b) top 100 companies and (c) the subsidiary or associate companies of the companies listed at KLSE that have link page at their holding company's Web site. The final sample size is as follows:

KLSE top 100 companies (a)	69
Link page to KLSE homepage (b)	278
Others (c)	18
Less: companies included in top	
100 above	<u>(58)</u>
	307
Web sites cannot be accessed	<u>(36)</u>
Total sample size	271

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Similar procedure as 3.3.1 above is being carried to find the corporate Web site address.

¹⁰ Corporate announcement refers to announcement made to KLSE that would be of interest to investors. For example, corporate earning, quarterly report, dividend, changes to Board of Directors and etc.

3.4 Dependent Variables

A variety of web sites characteristics identified during the visits of the company's home page. Ettredge *et al.* (2000a) proposed disclosure index as proxy for the extent of financial disclosure. Similarly, Firth (1979), Chow and Wong-Boren (1987), Hossain and Adams (1995) also use disclosure index when they conduct study on voluntary financial disclosure. However, the items of disclosures vary across studies.

Ettredge *et al.* (2000a) define financial disclosure as information that investor relation personnel consider of interest to investors including financial and non-financial information. Hence the characteristics of financial disclosures are divided into two categories that are the required reports (REQ) and the voluntary disclosures (VOL). Required reports are reports that are required under the present corporation laws of Malaysia namely annual reports and quarterly reports. These reports are required to be lodged with KLSE under the present condition. Voluntary disclosures comprise of corporate announcement, performance overview, historical share price, current share price, link to elsewhere in the Internet for share price, speeches made during recent road show or conference call and the recent financial data, for example current sales turnover. The characteristics, together with their scoring rules are defined in Table 3.1.

During the online survey of the corporate Web sites, the contents of the Web sites were compared against the disclosure items discussed above. If an item was found, it was coded as 1, if not, 0. For the purpose of this study, the annual report for the financial year-end 2000 is used as a benchmark for scoring. In other words, if a corporate Web site discloses annual report for financial year-end 2000 and after, will be coded as 1, else, 0. Similarly, for quarterly report, the benchmark for scoring will be based on quarterly reported for period ended in year 2000 and after. This is consistent to the study of Hossain and Adams (1995) where only the latest annual reports were used in their study. The disclosure index derived by this method is essentially unweighted and assumes that each item of the disclosure is equally important [Cooke (1991), Hossain and Adams (1995) and Ettredge *et al.* (2000a)].

Table 3.1: Definition of the Dependent Variables

Category: Required Reports

Characteristic	Scoring Rule
Annual Report	= 'One' if the site provides a complete annual report (financial statements inclusive of profit and loss account, balance sheet, cash flow statement and notes to the account) = 'Zero' if no annual report information is available
Quarterly report	= 'One' if the sites provides quarterly reports including financial statements = 'Zero' if no quarterly report information is available
REQ	= The sum of the scores of the above two characteristics

Category: Voluntary Disclosures

Characteristic	Scoring Rule
Recent	= 'One' if recent monthly financial data are available and 'zero' otherwise.
Overview	= 'One' if the site provides a high level of overview of the firm's performance (highlights, fact sheet, 'frequently asked questions'), and 'zero' otherwise.
Corporate announcement	= 'One' if the site provides a calendar of events of interest to investors (such as earning release date), and 'zero' otherwise.
Analyst	= 'One' if the site lists analysts or provides links to analyst reports, and 'zero' otherwise.
Speeches	= 'One' if the site presents the text of speeches and presentations (such as those made at 'road shows'), and 'zero' otherwise.
Current	= 'One' if the site provides same-day stock prices and 'zero' otherwise.
Historical	= 'One' if the site provides historical stock prices, and 'zero' otherwise
Link	= 'One' if the site provides a link to stock data at a different site, and 'zero' otherwise
VOL	= The sum of the above eight characteristics
INDEX	= REQ + VOL

Unweighted indices were used because numerous criticisms of weighted disclosure indices can be found in the accounting literature. For example Hossain and Adams (1995) quoted the criticisms of Gray *et al.* (1992) that considerable subjectivity exists in the assignment weights by users group. Chow and Wong-Boren (1987) found that statistical results are the same for both weighted and unweighted indices are used to derive disclosure scores. Further Cooke (1991) suggests that unweighted score is preferable over

weighted score when the focus of the study is directed to all prospective users.

In this study, the disclosure score of each category (REQ and VOL) for each company are computed based on the actual score awarded for each disclosure item. Thereafter the total score of REQ and VOL is sum up to give total disclosure score, INDEX. This INDEX will be the dependent variable representing company disclosure scores. By doing so, each company is subjected to the maximum possible score applicable for each entity. Therefore all companies have equal opportunity to score for each item. This is consistent to the study of Cooke (1991), Hossain and Adams (1995) and Ettredge *et al.* (2000a) in analysing the report of each company to establish the relevance to the firm of each disclosure item.

3.5 Independent Variables

Prior year studies on voluntary financial disclosure have always linked the practice and firm specific characteristics. The commonly tested characteristics are firm size and financial leverage [Singhvi and Desai (1971), Firth (1979), Chow and Wong-Boren (1987), Hossain and Adams (1995)]. Other variables that have been used include assets-in-place, type of audit firm, number of shareholders and so forth. The measurement of each variable used also varies across the studies. On the electronic dissemination of financial information, thus far, the variable used to test the extent of financial disclosure over the Internet is the firm size [Marston and Leow (1998), Ashbaugh *et al.* (1999) and Ettredge *et al.* (2000a)]. Other variables used are the industry membership, firm's performance, need for external equity capital, correlations between annual returns and earning [Ettredge *et al.* (2000a)].

For the purpose of this study, after considering the prior literature, five independent variables were measured using data obtained from the corporate Web sites of each selected companies. The proxies used are disclosed in the following section.

3.5.1 Firm Size

Numerous studies have used various proxies such as the market value, total assets, number of employee and sales turnover as proxies to firm size [Firth

(1979), Chow and Wong-Boren (1987), Marston and Leow (1998), Ashbaug *et al.* (1999), Ettredge *et al.* (2000a)]. However only market capitalisation is tested positive as surrogate of firm size. Hence market capitalisation is used as proxy of firm size. Firm size is measured by the natural logarithm of market capitalisation¹¹ as at 31 December 2000 for companies listed at KLSE. The market capitalisation of each sample company was obtained from Investors Digest (2001).

In addition, listing status is also used as an alternative specification of the size hypothesis. Hence, companies listed on the main board of KLSE are coded as 1, and 0 otherwise.

3.5.2 Financial Leverage

There are various measures used to test the financial leverage hypothesis. Chow and Wong-Boren (1987) used book value of the debt divided by firm size as proxy to financial leverage. Hossain and Adams (1995) consider only the long-term debt to the book value of the owners' equity. Susela (1998) as quoted by Chow (2001) defined financial leverage as book value of total debt including provisions for liabilities and charges divided by total shareholders funds. Hence the financial leverage variable used for this study follows Susela (1998) definition.

3.5.3 Assets-in-Place

Measure used to the assets-in-place hypothesis in the previous literature is represented by the ratio of book value of fixed assets (net of depreciation) to the book value of total assets [Chow and Wong-Boren (1987), Hossain and Adams (1995)]. Hence this measure is used to compute assets-in-place for the hypothesis testing purposes.

3.5.4 Type of Auditor

Hossain and Adams (1995) has defined 'Big Six' audit firm as comprises of PriceWaterhouse, Coopers and Lybrand, Arthur Anderson, Deloitte Touche Tohmatsu, Ernst & Young and KPMG Peat Marwick. However since the

¹¹ Natural logarithm transformations were used to reduce skewness in the data set.

merger of Price Waterhouse and Coopers and Lybrand, the 'Big Six' audit firm has become 'Big Five' now. Hence auditor is represented by a dummy variable of '1' if they are members of 'Big Five' and '0' refer to non-'Big Five' audit firms.

3.5.5 Number of Shareholders

The ownership distribution has a significant influence on the quality of disclosure in annual reports (Singhvi and Desai 1971). The measure of number of shareholders is the absolute number of shareholders as reported in the annual report (Singhvi and Desai 1971). For the purpose of this study, the number of shareholders is natural logarithm of number of shareholders as reported in the annual report used to evaluate financial disclosure¹².

3.6 Statistical Tests

The study used both univariate and multivariate tests to examine the hypotheses. The student's t test was conducted to examine whether categorical independent variables, namely type of audit firm and listing status had an impact on the overall level of voluntary disclosure. Pearson product-moment correlation coefficients (r) were used to ascertain the correlation between the disclosure index and continuous independent variables, namely firm size, financial leverage, assets-in-place and number of shareholders. Spearman correlation coefficients (r) were also used to test for an association between the independent variables.

A linear regression analysis was used for multivariate test. The multivariate test serves to supplement the univariate test and provide an appropriate means of considering the combined effects of independent variables on the extent of voluntary financial disclosure in the Internet.

For the purpose of statistical analysis, Statistical Package for Social Sciences (SPSS) is used to test the associations of the various independent variables and the dependent variable as outline in this chapter.

¹² Natural logarithm transformations were used to reduce skewness in the data set.

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.