

CHAPTER 5

RESULTS OF THE STUDY

To summarize the results of this study, two separated parts are presented: the survey results and the empirical results. The first part presents the opinions on the disclosure of environmental items and the opinions on environmental reports including the auditor's report. The second part reports the empirical results of the positive/negative information and the association between environmental disclosure and firms' characteristics as hypothesized in Chapter 1.

5.1 Respondents' Demographics

The respondents were separated into two groups : the providers of information and the users of information. In the provider group, 123 respondents from 101 firms, there were more males (80 respondents, 64.9%) than females (43 respondents, 35.1%). The majority of them were between 30 and 40 years of age (50.9% of all respondents). Their education levels were mixed between undergraduate (46.5%) and graduate (44.7%). There were 55 respondents from finance/accounting departments (48.2%) and others from top management, mainly Managing Director (11 respondents, 9.6%) and deputy or assistant Managing Director (17 respondents, 14.9%). They identified that they were in middle (44.7%) or high (43%) management level with experience of more than 3 years (76.3/5). The knowledge about environmental accounting of the respondents varied from fair (31.6%) to not-at-all (22.8%).

In the user group, 173 respondents, there also were more males (101 respondents, 58.4%) than females (72 respondents, 37.3%). Most of them were between 30 and 40 years of age (72%). Their educational backgrounds were higher than the first group, 75.9% were graduate or higher. They identified their positions as top management (42.8%) and middle management (31.3%), and had experience of more than 3 years (62.7%). The knowledge about environmental accounting of the respondents were equally stated as fair (36.1%) and little (36.1%).

To examine all respondents, both providers and users groups were combined. There were more males (60.7%) than females (37.5%). Age of 30-40 years old dominated all respondents (46.4%). The majority of them held graduate or higher degree (63.6%). And finally, they were equally classified themselves to have fair (34.6%) or little (34.6%) knowledge in environmental accounting.

5.2 Survey Results

The purposes of this survey are to identify the information that should be disclosed when environmental concerns exists giving no separate report is required and to propose an environmental report giving a separate report is desired. For the first purpose, environmental information was classified into seven elements: environmental policies, plans, projects, laws conformity, assets/expenses, benefits and contingent liabilities. Considering the impacts of each element on the potential earning of the companies, environmental policies, plans, projects, and benefits were considered as positive information, whereas, contingent liabilities were considered as negative information to the companies. (Section 5.4.1 in this chapter provides more discussion) The results of this issue are presented in accordance with provider group, user group, and overall to observe the opinions from each group and to conclude to the consensus results.

For the second purpose, an example of an environmental report was provided for comments. The report was generated from the idea to separate the environmental report from the financial reports. It can be presented as a supplemental report to the financial statements and its financial figures can be reconciled to the figures in the financial statements. The report started with the auditor's report, balance sheet, profit and loss statement, and notes to environmental statements. The notes to environmental statements included accounting policies, environmental policies, plans, projects, laws confirmation, and contingent liabilities.

5.3 Opinion on Environmental Information Disclosures and Report Pattern

The results of this study are delineated in accordance with provider group, user group, and overall. In the provider group, the results are presented separately among : 19 industrial groups and nine strata with regards to size and Return on Investment [ROI] after both accountant and management replied to the questionnaires.

In the user group, the results are reported in relation to the groups of institutional investors, government agencies, creditors, communities, and intermediaries. In summary, the results of total respondents from the user group are reported.

In conclusion, the overall results from all respondents, both provider and user groups, are computed and presented. Both unweighted and weighted scores are shown for comparison purposes.

5.3.1 Opinion about Disclosure by the Provider Group

The provider group in this study was categorized into 19 groups of industry and nine strata with regards to size and ROI. The following parts start with the summary of opinions about the disclosure of environmental policies, environmental plans, environmental projects, law conformity, assets/expenses, benefits, and contingent liabilities. The reason to separately presents the results according to industry groups and groups with regards to size and ROI is to observe whether industry group, size, and economic performance could affect to the idea of disclosing each information. The results could assist in the summary for implementation purpose. Then, the second part is a summary of the opinions about the environmental report. These parts present only the results in accordance with the industry groups.

5.3.1.1 Opinions about Disclosure Items from Industry Group

The respondents from each industry group provided the opinions on disclosures of each element of environmental information using score system. The scores were in the range from zero to four. Zero meant "do not disclose such item". One meant "disclose by explanation", two meant "disclose by explanation and identify magnitude level", three meant "disclose by providing financial data", and four meant "disclose by providing financial data and separating from other items in the report". The following analysis of results is presented in the mean average rather than the frequency mode. The reasons are that: 1) the scores from the respondents within each industry and each group with regard to size and ROI did not show significant deviation from their average mean (most are between one and two); and 2) although this analysis used discreet variable to represent disclosure level, the ordering of the number has obviously presented qualitative magnitude from low to high level.

The results concluded that disclosure of environmental assets/expenses was more desirable than other elements in this study. It received the average score of 1.64 which meant that this information should be disclosed by explanation with the tendency to refer to their magnitude. The disclosure of environmental projects gained the lowest average score of 1.38 which meant that this information should be disclosed by explanation style. Electrical products and computer was the industry group that provided the highest average score in disclosing overall elements of 2.33 which meant that disclosure should refer to their magnitude and tend to refer to financial information. Vehicles and parts and food and beverage provided the lowest average score in disclosing all elements of 0.8 and 0.86 respectively which meant that disclosure should be in explanation style.

- Environmental Policies

The company's environmental policy was explained as the policy dealing with the natural environment that had effects on business such as: ground, water, and air. The examples of environmental policy included policy of safety, saving energy, saving

natural resources, replacement of natural resources, quality management, waste reduction, recycling, minimizing pollution. The average score obtained from the respondents was more than 1 ($\bar{X} = 1.48$) meant that the firms agreed in disclosing this information rather than just explaining. This information could be viewed to identify the high/low level of practices. Electrical products and computer provided the highest average score to disclose with financial information ($\bar{X} = 3$) whereas, food and beverage, hotels and travel services, jewelry and ornaments, and packaging had the lowest average score to disclose by explanation ($\bar{X} = 1$).

- Environmental Plans

Environmental plans included the companies' plans related to the environment. The examples as provided in the questionnaire were: set up specific division for environmental management; connect environmental policy to management's responsibility; assign responsibility and duty to manage environment; apply ISO 14000 as guideline; and follow-up and evaluate environmental performance periodically. The average score of this element was 1.44. The result could mean that this information should be disclosed by explaining with reference to its magnitude. The chemical and plastic group had the highest average score to disclose with reference to their magnitude ($\bar{X} = 2.25$) whereas several industries with cases less than five included: pharmaceutical products and cosmetics; vehicles and parts; food and beverage; electronic components; jewelry and ornaments; mining; and packaging provided that this information should be disclosed by explain ($\bar{X} = 1$).

- Environmental Projects

Environmental projects were identified as expenses or costs incurred in order to 1) preserve the environment 2) make the current environment better. In this study, environmental projects were classified into two groups: projects in marketing function and projects in production function. Projects in the marketing function might include: the companies' products are environmental friendly; provide safety instructions; decrease size but maintain the same quality; packaging can be recycled; packaging

can be analyzed; packaging does not cause garbage; perform public relations with respect to the companies' environmental concern; and apply environment issues in the companies' strategy. Projects in production function included: build up system for waste-water treatment; eliminate waste; eliminate pollution; save energy; save natural resources; concern with quality control; concern with safety; set up maintenance systems; provide replacement of natural resources; decrease waste; decrease cost; and decrease noise pollution.

The respondents had the average score of 1.38, which was the lowest score among all elements and meant that this information should be disclosed by explanation with tendency to refer to their magnitude. Electrical products and computer group provided the highest average score for this item, to disclose with reference to their magnitude ($\bar{X} = 2.33$). Several industries expressed opinion to disclose this information in explanation ($\bar{X} = 1$). Those industries included pharmaceutical products and cosmetics; printing and publishing; textile, clothing and footwear; vehicle and parts; food and beverage; hotels and travel services; electronic component; mining; and packaging. It was evident that the companies did not have environmental projects to the greater extent when compared to other operating projects (see section 5.4.2.1.1). This could result to the lower mean score for this element.

- Law Conformity

The costs that a company spent in order to comply with the regulations were mainly concerned here. The average score for disclosing this information was 1.41 which meant that disclosure should be explanation with the tendency to refer to their magnitude. Chemical and plastics provided the highest score in this item, to disclose with reference to their financial data or their magnitude ($\bar{X} = 2.5$). Seven groups provided opinion of disclose this element by explanation ($\bar{X} = 1$). The groups included: property development; pharmaceutical products and cosmetics; printing and publishing; textile, clothing and footwear; food and beverage; hotels and travel services; electronic component; and mining.

- Assets/Expenses

A company had environmental assets from costs incurred to improve or develop the production system to prevent future pollution. At the same time, a company could have environmental expenses from costs incurred to clean up the pollution the company had created in the past. The average score obtained for this element was the highest among all elements ($\bar{X} = 1.64$) which means the disclosure tend to be explanation with reference to its magnitude. This element had high score may be because it had no measurement problem and it can be extracted or reclassified from the financial statements.

Printing / publishing provided the highest average score of disclosing with reference to financial information ($\bar{X} = 3$). The groups of textile, clothing and footwear; hotels and travel services; electronic components; and mining expressed to disclose this element by explain ($\bar{X} = 1$).

- Benefits

Benefits involving the environment may have arisen from the benefits a company received as a result of its environmental project. The respondents gave the average score of 1.44 (disclose by explanation with tendency to refer to their magnitude). Packaging provided the highest average score of 3.0 (disclose by giving financial data). Several groups agreed to disclose this information by explain ($\bar{X} = 1$). The groups included: printing and publishing; textile, clothing and footwear; food and beverage; building and furnishing material; hotels and travel services; jewelry and ornaments; and mining.

- Contingent Liabilities

Contingent liabilities regarding environment could include such future liabilities with high possibility to be incurred and the loss amounts can be reasonably estimated.

The average score was 1.44 (disclose by explanation with tendency to refer to their magnitude). Packaging had the highest average score of 3.0 (disclose by giving financial data). Food and beverage expressed either not to disclose this item or disclose with explanation ($\bar{X} = 0.5$). Vehicles and parts had the lowest average score of not disclose this information ($\bar{X} = 0$).

A table contained the mean score of disclosure for each element and separated by industry groups is presented in Appendix B-1.

5.3.1.2 Opinions about Disclosure Items from Size and ROI Group

The responses were reclassified into nine groups according to its size and ROI. The size was separated into three groups and so did the ROI. Then combined those three by three groups to generate nine groups with the first group represented "big size and high ROI", the second group represented "big size and medium ROI", and so on. The middle group with medium size and medium ROI had the highest average score of 2.19 (disclose by explanation with reference to their magnitude) while the group with medium size and high ROI had the lowest average score of 0.71 (disclose with explanation). The followings present the results of opinions on environmental information: policies, plans, projects, law conformity, assets/ expenses, benefits, and contingent liabilities.

- Environmental Policies

The group that had the highest average score ($\bar{X} = 2.22$), which means disclosure with reference to their magnitude, was the middle group, medium size and medium ROI. The group with medium size and high ROI had the lowest average score of 1.00 (disclose by explain).

- Environmental Plans

The middle group had the highest average score ($\bar{X} = 2.0$), which means disclosure with reference to their magnitude. Group one (big size and high ROI) and group seven (small size and high ROI) had the lowest average score of 1.0 (disclose by explain).

- Environmental Projects

The middle group also had the highest average score ($\bar{X} = 2.25$) for disclosing this information with reference to their magnitude. Group four (medium size and high ROI) and group eight (small size and medium ROI) had the lowest average score of disclosure by explain ($\bar{X} = 1.0$).

- Law Conformity

The middle group also had the highest average score ($\bar{X} = 2.2$) for disclosing this information with reference to their magnitude. The group with medium size and high ROI had the lowest average score of less than one ($\bar{X} = 0.67$) which meant that disclosure should be at best by explain.

- Assets/Expenses

The middle group still had the highest average score for disclosing assets/expenses with reference to their magnitude with the tendency to include financial data ($\bar{X} = 2.67$). The group with medium size and high ROI had the lowest average score of not disclose this information ($\bar{X} = 0$).

- Benefits

The middle group obtained the highest average score in disclosing this information with reference to their magnitude ($\bar{X} = 2$). Group four (medium size and high ROI) and group seven (small size and high ROI) had the lowest average score of disclosing this information by explain ($\bar{X} = 1.0$).

- Contingent Liabilities

Group five (the middle group) and group six (medium size and low ROI) shared the same highest average score in disclosing this information with reference to their magnitude ($\bar{X} = 2$). The group with medium size and high ROI had the lowest average score of not disclosing this item ($\bar{X} = 0$).

Table in Appendix B-2 presents the results in detail.

5.3.1.3 Opinions about Disclosure Pattern - Provider Group

A full report of environmental statements was presented and comments were requested from the respondents. The report covered the auditor's report, balance sheet, profit and loss statements and notes to environmental statements. The scores were in the range from two to minus two. Two meant "strongly agree", one meant "agree", minus one meant "disagree", and minus two meant "strongly disagree".

The following analysis of results is presented in the mean average rather than the frequency mode. The reasons is the scores from the respondents within each industry did not show significant deviation from their average mean (most are between one and minus one).

The result of this part concluded that the purposed environmental report was in general supported by the respondents with the overall average score of 0.54. The

disclosure of law conformity in notes to environmental statements received the highest average score of acceptance ($\bar{X} = 0.92$). Revenue in profit and loss statement received the lowest average score of acceptance ($\bar{X} = 0.05$).

Jewelry and ornament highly supported overall disclosure pattern with the average score of 1.73. Pulp and paper neither agreed nor disagreed with the pattern ($\bar{X} = 0$).

The comments and suggestions for agreement/disagreement are also presented here. These following comments were gathered from the responded questionnaires. Less than 50 percent of the responses provided the reasons to support their agreement/disagreement.

This part presents only the opinions, comments, and suggestions from the industry group and the results found as follows:

- Auditor's Report

The average score for this element was acceptance at 0.5. Vehicle and part, electronic component, energy, and jewelry and ornament had the highest average score in agreed level ($\bar{X} = 1.0$). Health care services and electrical products and computers showed disagreement in the level of -0.25 and -0.33.

There were comments on both agreed and disagreed to have the auditor's report. In the agreement side, the most frequent reason to support the idea was "to encourage the responsibility of business to environment". The second frequent reason came from three reasons: 1) to learn that the companies have actually performed as they claimed; 2) the disclosed information is more realistic; and 3) the environmental management can be improved. The third frequent reason came from the format was clear and understandable. Other reasons included the international trade concerns and the insufficiency of government agency manpower.

On the other hand, the main reason of disagreement was “too much detail and too difficult to prepare that may cause more business’ burden”. The second concern was no standard and resulting to difficulty in audit. The third concern was unnecessary to separate from the financial statements and users of financial statements are not interested in environmental information. Other opinions were included to lessen the importance of financial statements or to cause misleading of the users of financial statements; environmental issue should be internal audit; and concern of auditor’s qualification.

- Balance Sheet - Assets

The element received the same average score of acceptance as auditor’s report ($\bar{X} = 0.5$). Jewelry and ornaments had the highest average supporting score ($\bar{X} = 1.5$). Food and beverage had the lowest average score of disagreement ($\bar{X} = -0.67$).

The respondents provided the most frequent reason for support that “clear view on the environmental investment”. The second frequent supporting reason was to encourage environmental concern. The third frequent supporting reason was to be able to measured. Another support was the benefit in trade.

On the disagreement side, the main concern was that “the issues are too complicated” and that “it would be too difficult to collect data”. The second concern was disagreement to separate from financial statements. Other concerns included financial statement users may not be interested; environmental responsibility should be measured by qualitative information; information is insufficient; and should not be presented in the format like financial statements.

- Balance Sheet - Liabilities

The element received lower average degree of supporting ($\bar{X} = 0.36$). Jewelry and ornaments highly supported ($\bar{X} = 1.5$). Food and beverage consistently disagreed ($\bar{X} = -0.67$).

The supporting reason came mainly from "clear presentation and separating environmental liability from other liabilities". The subordinate reason came from encouragement to environmental responsibility. And other reasons came from measurability; providing same standard ; and benefit for international trade.

However, there were lot of disagreements, with the main reasons being "too detailed, difficult to collect data, and its uncertainty". Other reasons for disagreement included unnecessary to separate from financial statements, and inattention by financial statement users. And finally, there also were some other reasons of bad image, unnecessary to use quantitative approach, and lack of sufficient detail.

- Profit and Loss - Revenue

This element received the lowest average score with neither agreed nor disagreed by the respondents ($\bar{X} = 0.05$). Jewelry and ornament had the highest average score of acceptance ($\bar{X} = 1.5$). Seven industries provided the average score of disagreement. Food and beverage highly disagreed with this element in the average score of -1.0.

Fourteen out of twenty-three respondents provided supporting of environmental revenue because "it had clear presentation of the results of investment". Other supporting reasons were to encourage environmental responsibility, to create standard for measurement, to be useful for budgeting, to generate revenue in financial statements, and to have benefit for trading.

However, a number of respondents opposed the idea due to "its difficulty in measurement and putting more burden on business" (23 out of 40). Others disagreed on this issue because it was unnecessary to separate from the financial statements, it cannot gain attention from users, and financial statement and environmental performance should not be measured in quantity. Lack of detail, lack of standard, and no tax effect were other reasons of disagreement.

- Profit and Loss - Expenses

This element received higher degree of acceptance than the previous one ($\bar{X} = 0.4$). Jewelry and ornament also had the highest average score in acceptance ($\bar{X} = 1.5$). Food and beverage disagreed with this element with the average score of -0.67.

The majority of respondents that supported the idea reasoned that “it had clear presentation of results from investment”. The second frequently mentioned supporting reason was split between measurability and encouraging environmental responsibility. Other concerns were to encourage standard setting, to benefit trading, and to provide information for budgets.

On the other hand, the majority of respondents that disagreed reasoned that “it was too detailed and difficult to calculate”. The second frequent disagreement view was that it was unnecessary for financial statement users and should be included in the financial statements. The minority of the responses provided the reasons of creating negative results from the early stage, no tax effect, unnecessary to quantify, lack of detail, and should be internal matter.

- Notes to Statements - Accounting Policies

This element received even slightly higher average score than the previous elements ($\bar{X} = 0.5$). Jewelry and ornament, again, had the highest average score of strong agreement ($\bar{X} = 2$). Hotels and travel services disagreed with this element ($\bar{X} = -0.5$).

The majority of respondents agreed that it provided “clear presentation about accounting policies”. Other respondents viewed that it could encourage environmental responsibility, provide good start, provide financial planning, be of benefit for trading, be comparable, and have clear measurement.

The major reasons for disagreement were that “it is too detailed and difficult to collect data”. Other reasons included: unnecessary to separate from financial statements, inattention from users, unrelated to accounting issues, disagreement with the format, and creating confusion to the user.

- Notes to Statements - Environmental Policies

The element received average score higher than those elements related to financial statement ($\bar{X} = 0.9$). Jewelry and ornament highly supported this issue with the average score of 2 (strongly agree). None of industry expressed disagreement. The lowest average score of support obtained from pulp and paper ($\bar{X} = 0$).

Respondents expressed landslide agreement with the reason of “good start, announcement of the company’s policy, and establishment of the target for the company”. Other reasons included benefit for trading, comparability, capability to do, and clear presentation.

Few respondents disagreed to disclose this information. The following reasons were provided: inattention by financial statement users; unnecessary to separate from financial statement; no clear standard and measurement; and create confusion.

- Notes to Statements - Environmental Plans

This element received the average score of 0.8. Jewelry and ornament had the highest average score of acceptance ($\bar{X} = 2$). Pulp and paper neither accepted nor rejected this issue.

Similar to the opinion on environmental policy, the majority of the responses agreed that “this information could be the framework and schedule for operations”. Other reasons included benefit for trading, encouraging to environmental responsibility, comparability, and clear presentation.

The reasons for disagreement were also similar to the above topics which included inattention from financial statement user, unnecessary to separate from financial statements, plan can be changed, cannot be applied to every business, and high investment.

- Notes to Statements - Environmental Projects

The element received high average score of acceptance but slightly lower than the previous element ($\bar{X} = 0.76$). Jewelry and ornament still had the highest average score of acceptance ($\bar{X} = 2$). Two industries neither agreed nor disagreed with this element ($\bar{X} = 0$). They were pulp and paper and energy group.

The majority of the respondents expressed agreement as same as the prior two elements. The reasons were also similar to those mentioned earlier, including clear presentation, display the results of operation, and can promote company's image. Few reasons came from be beneficial for trade, encourage responsibility, be comparable, and be useful for performance evaluation.

The minority of the respondents provided reasons for disagreement: the project is unclear; pay too much attention to short-term performance; information is unreliable; and creates confusion to users.

- Notes to Statements - Law Conformity

The average score of this element was the highest among all elements ($\bar{X} = 0.92$). Jewelry and ornaments had the highest average score in strong support ($\bar{X} = 2$). Three industries, including pulp and paper, food and beverage, and energy neither agreed nor disagreed with this element.

It was also found that the majority of the respondents supported this topic. The main reasons came from "informing the readers to the responsibility of the firms,

having clear presentation, and encouraging responsibility". Other reasons were also provided as benefit for trading and measurability.

However, few reasons were provided on the contrary to the above paragraph. They included inattention from users, unnecessary to separate from financial statements, creating confusion, and no clear standard.

- Notes to Statements - Contingent Liabilities

The average score of this element dropped to the same level of those elements related to financial statements ($\bar{X} = 0.4$). Jewelry and ornaments, again, had the highest average score of support ($\bar{X} = 2$). Three industries, including printing and publishing, vehicles and parts, and food and beverage disagreed with this issue with the average score of -0.2, -0.33, and -0.33 respectively.

Twenty-eight out of fifty provided the agreed reasons for this disclosure. Their main reason was "clear presentation of the liability". Other reasons were included the company can alert to the potential liability, comply with generally accepted accounting principle, and have benefit for trading.

Main reason of disagreement were "difficult to measure and create bad image to the firms". Other reasons were included inattention from users, unnecessary to separate from financial statements, no clear standard, create confusion, emphasize more toward profit and loss, and should present only positive information.

Table in Appendix B-3 presents the results in detail.

5.3.1.4 Suggestions from Provider Group

Suggestions can be summarized in term of format, contents and practical developments. Suggestions presented here were collected from the responded questionnaire. Around 10 percent of the respondents provided suggestions. Followings are suggestions about environmental report by each element separately.

- Auditor's report

Suggestions for the format were to report and audit only the items that can be measurable at the beginning stage.

Suggestions for contents included that the report should explain more details such as audit period and complete date, and included the ISO 14000 audit in the report.

Suggestions for practical purpose, included the following issues : standards should be set up to ease the audit; this audit should be voluntary and the fee should not be the companies' burden; the auditors must be unbiased and capable; and the auditor should come from government agencies.

- Balance Sheet

Suggestions for the format can be concluded as : this information should be generally presented in financial statements with separated section or disclosed separately only when the information is material, or presented as comparison to the plan.

Suggestion for contents included more details about assets related to environment were needed, different information were required according to industrial

types; contingent liabilities should not be recognized because of their uncertainty; and some items had no clear and reliable evidence.

Suggestions for practical development include problems in measurement; identify industries which are subject to disclosure; and provide incentive for disclosure.

- Profit and Loss Statement

All suggestions were related to contents of the statements. They are included problems in measurement have to be resolved, more details are necessary, and reliability of data at the date of the statement is necessary.

- Notes to Statements

Details on environmental projects should be expanded to include the whole project from the start to present. Problems of measurement could make quantified report unacceptable.

Suggestions for practical development were included: setting up standards for reporting and using the report as a mean to reduce liabilities.

5.3.2 Opinions about Disclosure by the User Group

The user groups in this study were categorized into five groups: institutional investors; government agencies; creditors; communities; and intermediaries. The opinions about the disclosure of environmental policies, environmental plans; environmental projects; law conformity; assets/expenses; benefits; and contingent liabilities giving no environmental report was presented are reported in the following paragraphs. The subsequent paragraphs report the results of the opinions on the proposed environmental report which included auditor's report, balance sheet, profit and loss statement, and notes to environmental statements.

5.3.2.1 Opinions about Disclosure Items - User Group

The respondents from each user group provided the scores to represent their opinions on disclosures of each element of environmental information. The scores were in the range from zero to four. Zero meant "do not disclose such item". One meant "disclose by explanation", two meant "disclose by explanation and identify magnitude level", three meant "disclose by providing financial data", and four meant "disclose by providing financial data and separating from other items in the report". The following analysis of results is presented in the mean average rather than the frequency mode. The reasons are that: 1) the scores from the respondents within each user group did not show significant deviation from their average mean (most are between two and three); 2) although this analysis used discreet variable to represent disclosure level, the ordering of the number has obviously presented qualitative magnitude from low to high level; and 3) The analysis is consistent to the analysis of provider group.

The responses from each user group provided that the average score for overall disclosures was at the level of disclosure with reference to their magnitude ($X = 2.39$). The necessity in disclosing the law conformity was higher than other elements with the average score of 2.72 (disclose with at least reference to their magnitude and having tendency to refer to financial data). Disclosure of environmental policies was viewed to have the least necessity with the average score of 2.12 (disclose with reference to their magnitude). The responses from the creditor group provided the highest average score in disclosing overall elements with reference to their magnitude ($\bar{X} = 2.51$). And the government agency group provided the lowest average score in disclosing overall elements ($\bar{X} = 2.34$). There was no significant difference among the opinions from all user groups.

- Environmental Policies

The average score of disclosing this element from all user groups was the lowest average score of all disclosure elements. The average score was 2.12. It was

interpreted that disclosure should explain with reference to its high/low level. Creditors had the highest average score in disclosing this element with reference to their magnitude ($\bar{X} = 2.42$). Communities had the lowest average score in disclosing this element ($\bar{X} = 1.63$).

- Environmental Plans

The average score of this element from all user groups was slightly higher than the previous element ($\bar{X} = 2.13$). Communities had the highest average score to disclose with reference to their magnitude and tend to refer to financial data ($\bar{X} = 2.63$) while institutional investors obtained the lowest average score to disclose with reference to their magnitude ($\bar{X} = 2.09$). One reason that this information received the lowest score could come from the uncertainty of the plans. Disclosures of this information did not confirm that the companies would perform as planned.

- Environmental Projects

The average score was 2.60 which meant that disclosure should be explanation with identifying high/low level or providing financial information. Creditors obtained the highest score ($\bar{X} = 2.67$) while institutional investors had the lowest score ($\bar{X} = 2.5$).

- Law Conformity

This information received the highest average score for its necessity to be disclosed. The average score was 2.72 which meant to disclose with reference to their magnitude and tend to refer to financial information. Communities had the highest average score to disclose with reference to financial information ($\bar{X} = 3$) while government agencies had the lowest average score ($\bar{X} = 2.54$). It was surprising that government agencies should need this information more than other groups. However, the government agencies may be able to find the information directly from the companies.

- Assets/Expenses

The average score for this information was 2.65 which meant that disclosure should be explanation with identifying high/low level or, if applicable, revealing economic value. Intermediaries obtained the highest average score of 2.88 (disclose with reference to their magnitude and try to refer to financial data) while communities obtained the lowest average score ($\bar{X} = 2.25$). It is obvious that this information can be measurable and evidence can be verifiable. Therefore this information was easy to be disclosed and reconciled with the data in the financial statements.

- Benefits

The average score of this information was rather low compared to other elements ($\bar{X} = 2.21$). Communities had the highest average score ($\bar{X} = 2.5$) while intermediaries had the lowest average score ($\bar{X} = 2.11$). Benefits from environmental performance had a measurement problem. Therefore the average score was low. However, the communities would like to see this information because it could present the company's responsibilities to the society.

- Contingent Liabilities

The average score of this information was slightly higher than benefits ($\bar{X} = 2.31$). Communities still had the highest average score ($\bar{X} = 2.5$) while government agencies had the lowest average score to disclose with reference to their magnitude ($\bar{X} = 2$).

Table in Appendix B-4 presents the results in detail.

5.3.2.2 Opinions about Disclosure Pattern - User Group

The user groups had also provided their view toward the proposed environmental statements. The analysis use the mean average of score provided by the respondents in consistent with those performs in the provider group. The scores were in the range from two to minus two. Two meant "strongly agree", one meant "agree", minus one meant "disagree", and minus two meant "strongly disagree". The following analysis of results is presented in the mean average rather than the frequency mode. The reason is the scores from the respondents within each group did not show significant deviation from their average mean (most are between one and minus one). Law conformity in the notes to environmental statements received the highest average supporting score ($\bar{X} = 1.2$). Revenues in the profit and loss statements received the lowest average supporting score ($\bar{X} = 0.25$). Communities highly supported this disclosure pattern with the average score of 0.83. Intermediaries had the lowest average supporting score ($\bar{X} = 0.61$).

The comments on the agreed and disagreed opinions of each element are also summarized. Less than 50 percent of the responses provided the reasons to support their agreement/disagreement.

- Auditor's report

The average score of this element was 0.55. Institutional investors obtained the highest average score in acceptance ($\bar{X} = 0.88$). Intermediaries had the lowest average score in acceptance ($\bar{X} = 0.3$)

The report was highly supported in "its understandability and clear presentation". The second supporting reason was to encourage environmental responsibility of businesses. And the third supporting reason was to support the idea of independent opinions on the statements. Other reasons included: to learn how the company complied with regulations, to use as reference for further studies, to have quantified

report, to have reliable report, to create company's reputation, and to follow-up the company's performance.

On the other hand, there were number of disagreements. The main disagreed reason was "too detailed and increase the companies' costs". The second concern was no standard and resulting too difficult to audit. Other concerns included: the problems of measurement, misleading to the financial users, and the qualification of the auditor.

- Balance Sheet - Assets

The average score remained the same as that of the previous element ($\bar{X} = 0.57$). Communities had the highest average supporting score ($\bar{X} = 0.75$). Government agencies had the lowest supporting score ($\bar{X} = 0.48$).

The responses provided the main reason in support was "to have a clear view of environmental investment". The second concern was to have information for comparability purposes. Other reasons included to encourage responsibility, and to apply the same format of financial statements.

The major disagreement came from "too detailed presentation". Difficult to separate the assets was the second concern. Other concerns included unnecessary to separate from financial statements, and unnecessary to have fixed format.

- Balance Sheet - Liabilities

The average score was still in the range of 0.5. Communities obtained the highest average score ($\bar{X} = 0.75$). Creditors obtained the lowest average score in supporting ($\bar{X} = 0.16$).

The main reason of support for this item was "to have clear picture and easy to audit". It also presented sufficient information and separated environmental liability

from other liabilities. Other supporting reasons were: to learn the company's performance; encourage environmental concerns; and to be useful for users.

The major disagreement was "to support disclosing in notes to financial statements". The subordinate disagreements were measurement, and more details were needed. Other concerns were: difficult to understand; unnecessary to separate from financial statements; and difficult to set standards.

- Profit and Loss - Revenue

This element received the lowest average score ($\bar{X} = 0.25$). Communities had the highest average score of support ($\bar{X} = 0.5$) while creditors had the average disagreed score ($\bar{X} = -0.17$).

The main supporting reasons were "to inform the investor about the real performance, to have clear presentation and to encourage environmental responsibility."

The second reason was to have benefit directly to the firm. Other reasons were that it could be initiative approach to present environmental information and can be audited.

The major disagreement came from "measurement problems". Other disagreements included: more details were needed; create more work; unnecessary for financial users; and unnecessary to separate from financial statements.

- Profit and Loss - Expenses

The average score of this item was slightly increased to 0.6. Communities obtained the highest average score in supporting ($\bar{X} = 0.87$). Creditors obtained the lowest average score in supporting ($\bar{X} = 0.5$).

The main reason in supporting the item was "clear presentation". The second reason was availability of data. Other reasons included: to encourage responsibility;

to apply conservative approach like financial statement concept; and to prove the company's policy.

The major disagreement was "too costly". The second reason was more details were needed. Other reasons included: unnecessary for financial statement users; unnecessary to separate from financial statements; and should not use the format of profit and loss statements.

- Notes to Statements - Accounting Policies

This element received higher average score than all prior elements ($\bar{X} = 0.73$). Government agencies had higher average score of support than other groups ($\bar{X} = 0.96$). Institutional investors had the lowest average score of support ($\bar{X} = 0.65$).

The major supporting reason of this item was "to be useful for the users to understand the standards used". Another major support was to have clear presentation. Other supports included: to be able to audit; to encourage responsibility; and to create the corporate image.

There were few arguments in "difficulty to prepare, no standard to comply with, unnecessary for analysis, and unnecessary to separate from financial statements".

- Notes to Statements - Environmental Policies

The average score of support for this element was in the same range of the previous elements ($\bar{X} = 0.78$). Creditors supported with the highest average score ($\bar{X} = 1$). Communities obtained the lowest average score of support ($\bar{X} = 0.62$).

Most of the supporting reason was "to encourage responsibility and to evaluate a company's performance". Other reasons were: benefit to investors; clear understanding; and promote the company's image.

The major disagreement was “more discreet information was needed”. Other reasons included: measurement and evaluation problem; unnecessary for financial statement users; and no standard.

- Notes to Statements - Environmental Plans

This element received a slightly higher average score than the previous one ($\bar{X} = 1.0$). Creditors had the highest average score of support ($\bar{X} = 1.16$). Intermediaries had the lowest average score of support ($\bar{X} = 0.76$).

The major support was “to have a clear picture of the company’s plans and performance”. Other reasons were to encourage environmental responsibility, to be benefit to users, and to promote the company’s image.

Few reasons in disagreement were mainly “unnecessary for financial statements users, unnecessary to separate from financial statements, and difficult to prepare”.

- Notes to Statements - Environmental Projects

The average score of this element remained as high as the previous element ($\bar{X} = 1.1$). Creditor supported with the highest average score of 1.33. Intermediaries supported with the lowest average score of 0.73.

The major reason in supporting was “to be able to evaluate the company’s performance and to encourage environmental responsibility”. Other reasons, similar to the other items, included to promote the company’s image, to be useful for users, and to learn to the company’s environmental performance.

The items of disagreement were “unnecessary to separate from financial statements, and difficult to prepare”.

- Notes to Statements - Law Conformity

This element received the highest average score of acceptance among all elements ($\bar{X} = 1.2$). Creditors supported with the highest average score ($\bar{X} = 1.41$). Intermediaries had the lowest average supporting score ($\bar{X} = 0.9$).

The major reasons in supporting this element were “to be able to evaluate the company’s performance and to encourage responsibility”. Other reasons included to create the company’s image, to be benefit to the users, and to see the collaboration between government and firms.

Some disagreements were: unnecessary to separate from financial statements; unnecessary for users; and difficult to prepare.

- Notes to Statements - Contingent Liabilities

The average score of this element dropped from the previous one ($\bar{X} = 0.79$). Institutional investors had the highest average score of support ($\bar{X} = 1$) and creditors, in contrast to their earlier opinions, had the lowest average score of support ($\bar{X} = 0.41$).

The major supporting reason was that “this element was necessary for the users and would affect future income”. Other reasons were to be aware the company of liability and to have clear understanding.

The disagreements came from “measurement problem and unnecessary to separate from financial statements”. Other disagreement was that it could be unfair to the disclosed firm if all firms did not disclose this information uniformly.

Table in Appendix B-5 presents the results in detail.

5.3.2.3 Suggestions from User Group

Suggestions to environmental report are separated into format, contents and practice. Around 20 percent of the respondents provided these following suggestions.

- Auditor's Report

A suggestion for format was to compare with the format from other independent investigators.

For contents, the report should include the audit period and the report date. It also should include the procedures used and the related laws or regulations.

For practical purpose, the standards should be issued gradually. The auditors must be unbiased and their extent of responsibilities should be clearly known. The accuracy of the figures shown in the report must be of major concern to the auditor.

- Balance Sheet

The suggestions for format were included the standard format should be applied to facilitate understanding; the format should include the requirement from ISO14000; and the accounts should be classified into more details to include low-pollution machines.

For contents, the details of each accounts should be disclosed. The definition of liabilities should include only costs to the society and measurement problem should be solved. Assets should include all environment-related assets. Only quantifiable and measurable items were accounted for in the balance sheet. If assets were required by laws, they should not be included in the balance sheet. The capital should be included in the balance sheet as same as financial statements.

For practical purposes, the standards should be imposed for identical practice. There should be tax incentive for good performance. Problems of allocation between projects related to environment and those not relevant to environment should be encountered.

- Profit and Loss Statements

For format, the suggestions were to use a form other than profit and loss statements, for example, apply budgeting format or separate only certain accounts from income statements for disclosure purpose. The format should be varied according to industries.

The suggestion for contents included: the clear measurement of revenue and expenses was needed; more details were required; the revenue should include the reduction of expenses resulting from the improvement of environmental performance; and the problem of allocation should be managed.

For practical purposes, the statements should initially emphasize disclosures in explanations. The standards should be imposed for the value used in the disclosure. The costs should include the effect to the neighbor or society. The provision for costs should be provided.

- Notes to Statements

The suggestions related to format were that disclosure should be discussed in the whole project. The explanation should be in brief style. The standard should be imposed. Policy and plan should be in the front page of the statements or notes.

For contents, the notes should include only accounting policies and future commitment.

For practical purpose, the audit and report should be performed by government agencies. The reports should be viewed or promoted as a marketing tool. The negative information should be disclosed compulsorily.

5.3.3 Opinions about Disclosure by Overall Samples

Overall respondents, after separately presenting the results between provider and user groups, were summarized to provide a total picture of the opinions about disclosure items giving no environmental report was presented and disclosure report pattern when a proposed environmental report was presented. The results are presented in two scenarios: unweighted score and weighted score.

- Weight for Users of Information

The weight for users of information was provided by both provider group and user group. The users of the information in this purpose were identified as management of the firm itself, shareholders, creditors, researchers, government authorities, and environmentalists. The weight for management used for entire provider group. The weight for shareholders used for institutional investors in the user group. The weight for creditors used for creditors in the user group. The weight for researchers used for intermediaries in the user group. The weight for government authorities used for government agencies in the user group. And, the weight for environmentalists used for the communities in the user group.

For management, the overall weight was 4.1778. The provider group had a weight of 4.0283, while the user group had a weight of 4.2744. The difference had no statistical significance at 0.05 level.

For shareholders, the overall weight was 3.5431. The provider group had a weight of 3.3846 while the user group had a weight of 3.6442. The difference had no statistical significance at 0.05 level.

For creditors, the overall weight was 3.3156. The provider group had a weight of 3.1584, while the user group had a weight of 3.4136. The difference had no statistical significance at 0.05 level.

For government authorities, the overall weight was 4.2313. The provider group had a weight of 4.0288. The user group had a weight of 4.3598. The difference contained statistical significance at 0.05 level.

For environmentalist, the overall weight was 4.3192. The provider group had a weight of 4.2178 while the user group had a weight of 4.3836. There was no statistical significance in the difference between the weights from the provider group and the user group.

For academic researchers, the average weight for overall samples was 3.9275. The provider group had a weight of 3.8544 while the user group had a weight of 3.9748. The difference had statistical significance at level of 0.01.

The following paragraph presents the result from the overall respondents in both unweighted and weighted scores.

5.3.3.1 Opinion about Disclosure Items - Overall Samples

The respondents agreed to recommend assets/expenses as the primary element that needed to be disclosed with the unweighted average score of 2.15 (disclose with reference to their magnitude). Environmental plans received the lowest unweighted average score from all respondents ($\bar{X} = 1.79$). The results were confirmed with the weighted average score.

When considering the average score obtained by the provider group and the user group, they were different and had statistical significance at 0.01 level in all elements except the opinions in disclosure of assets/expenses which had no statistical

significance at 0.05 and the opinions in disclosure of contingent liability which had statistical significant at 0.06.

- Environmental Policies

The average disclosure level (unweighted) as provided by all respondents was 1.83. This number was close to 2.0 which may mean that this information should be disclosed in explanation by the form that can be identified in magnitude (high/low level). The average disclosure level (weighted) for this issue was 7.57. The provider group had lower average score than the user group.

- Environmental Plans

The average disclosure level (unweighted) in this category was the lowest among all elements proposed in this study. The average score provided by all respondents was 1.79. The number was still close to 2.0. Thus, it can also be concluded that the form of disclosure should be in explanation with identifying its magnitude. The average disclosure level (weighted) for this issue was 7.39. The provider group had a lower average score.

- Environmental Projects

The average score (unweighted) was slightly higher than 2.0 ($\bar{X} = 2.05$). The score should strongly support that disclosure of this item should be in explanation with discussion of its magnitude. The average disclosure level (weighted) for this element was 8.60. The provider group also had lower average score.

- Law Conformity

This information received average score (unweighted) higher than the previous one ($\bar{X} = 2.06$). The average disclosure level (weighted) for this element was 8.75.

The conclusion should be similar to the disclosure of environmental projects: explanation with discussion of its magnitude. The user group had lower average score.

- Assets/Expenses

The respondents provided the highest average score (unweighted) for this element comparing to other elements in this study ($\bar{X} = 2.15$). Although the score was not high enough to support the disclosure in monetary format, it was found that this element needed to be disclosed more than explanation with discussion of its magnitude. The average score (weighted) for this issue was 9.07. The provider group had lower average score.

- Benefits

The average score (unweighted) was dropped to 1.82. Although this information was in the range of 2.0 (explanation with identifying its magnitude), it received slightly lower support than average score of other elements. The average score (weighted) for this issue was 7.56. The provider group had a lower average score.

- Contingent Liabilities

This information received the average score (unweighted) of 1.87. It can be concluded that the information should be disclosed by explanation to the extent that can identify its magnitude. The average score (weighted) for this item was 7.91. The provider group had a lower average score.

Table 5-1 a) presents the results of unweighted opinions and table 5-1 b) presents the results of weighted opinions.

Table 5-1 a) Opinion about Disclosure Items - Overall (Unweighted)

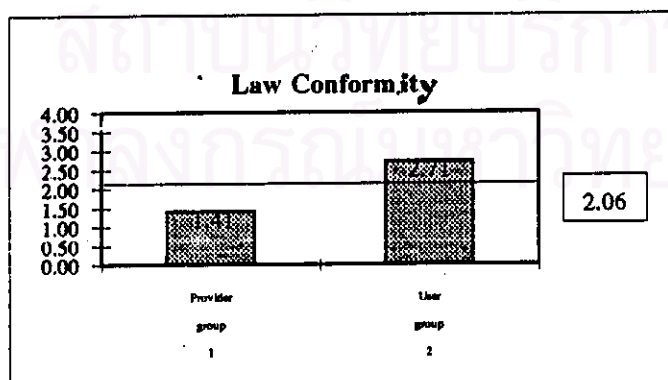
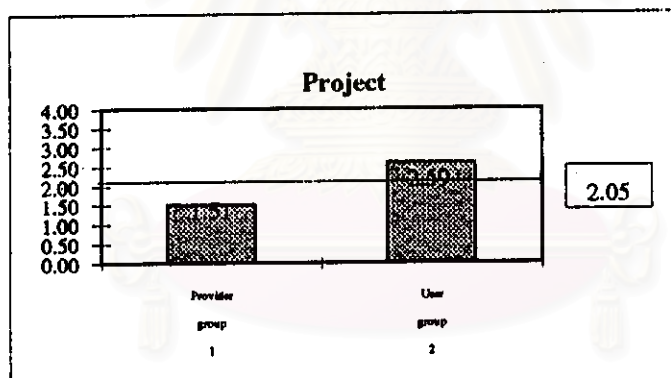
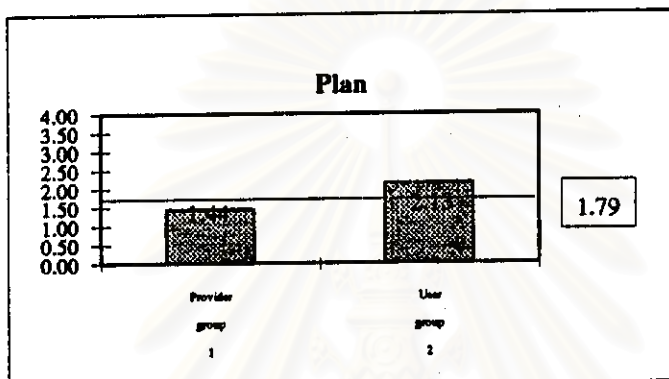
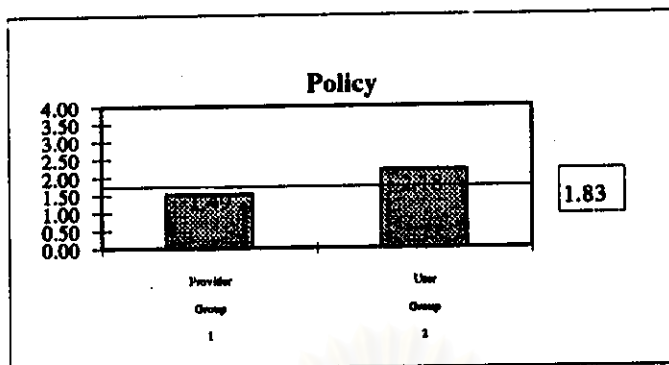


Table 5-1: a) Opinion about Disclosure Items - Overall (Unweighted)

(Continue)

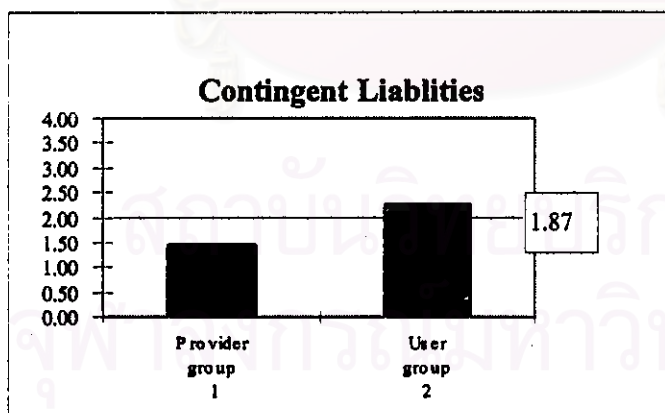
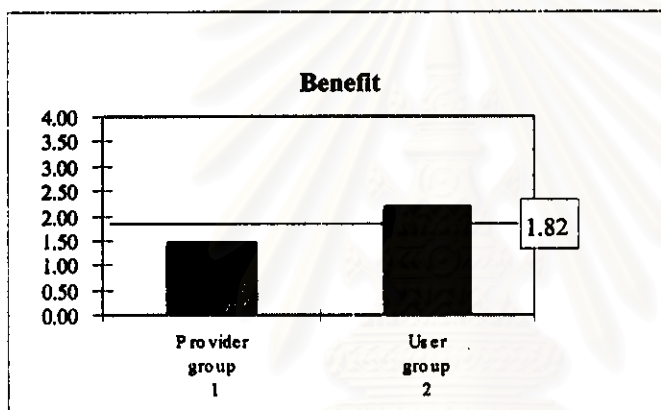
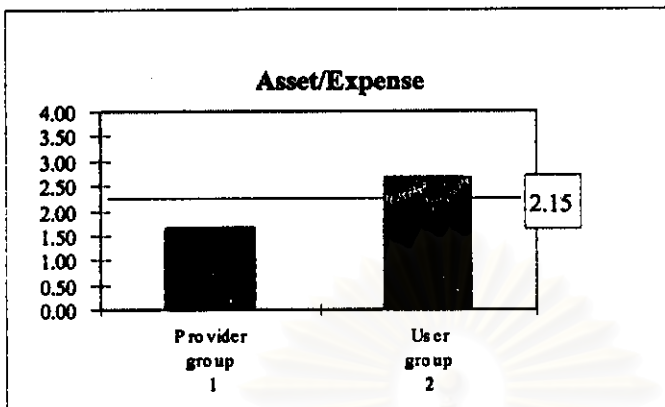


Table 5-1 b) Opinion about Disclosure Items - Overall (Weighted)

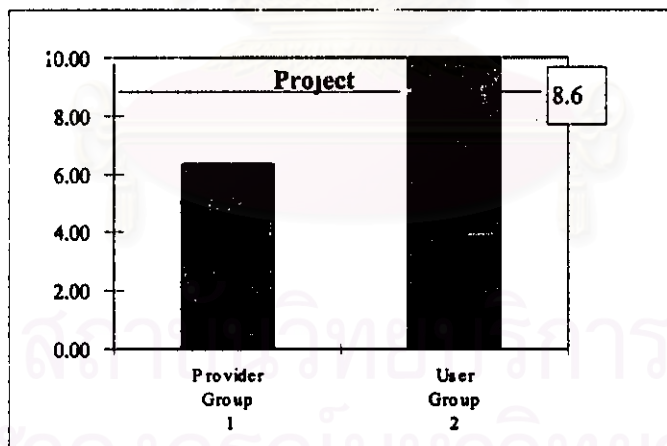
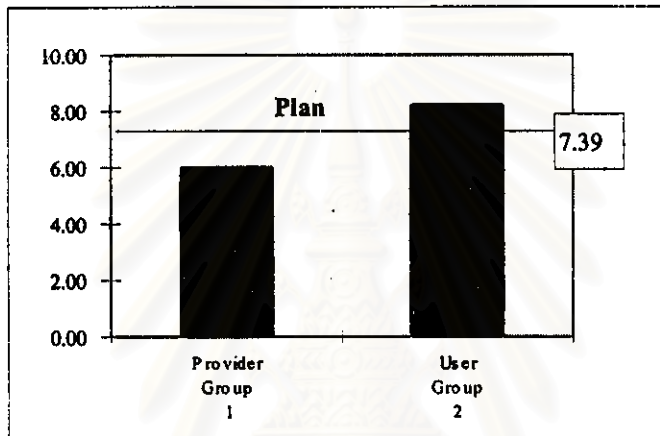
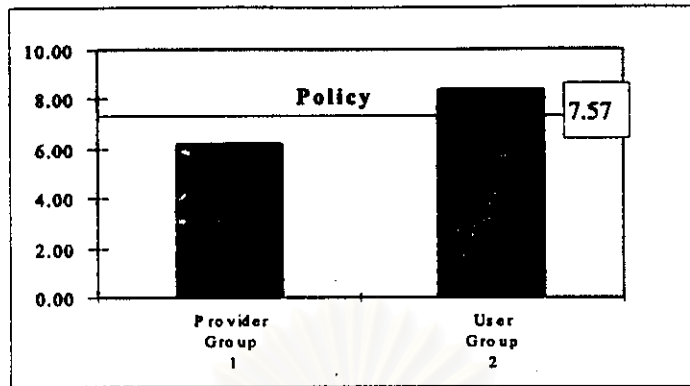
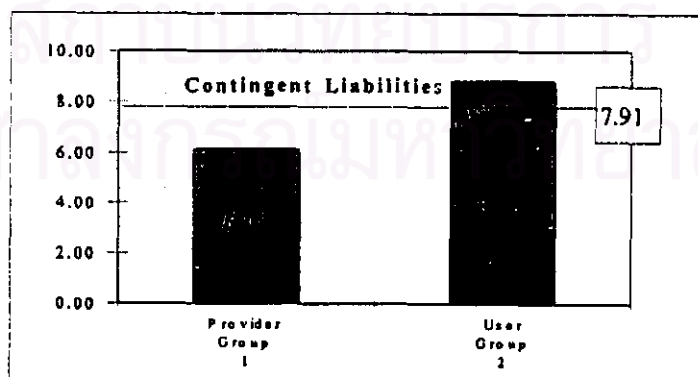
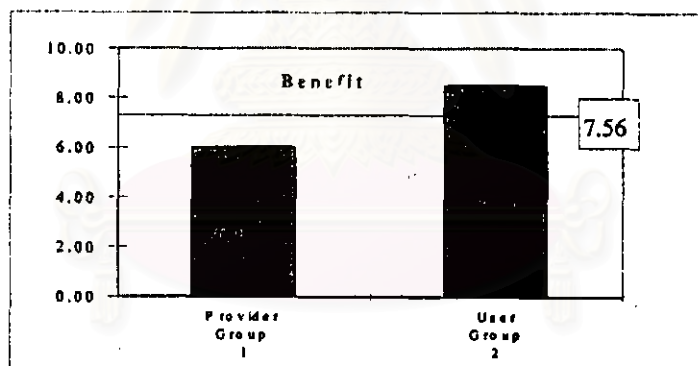
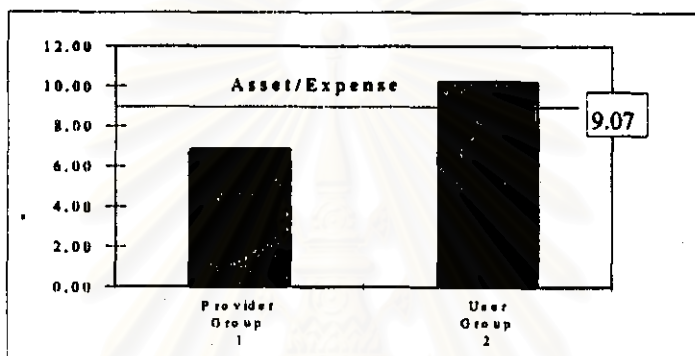
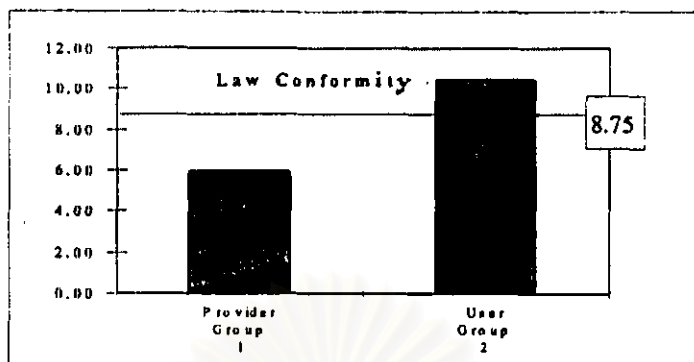


Table 5-1 b) Opinion about Disclosure Items - Overall (Weighted)

(Continue)



5.3.4.2 Opinions about Disclosure Pattern - Overall Samples

Combining the responses from the provider group and the user group, the opinions on proposed environmental report about notes to the statement in the law conformity issue received the highest average score of acceptance ($\bar{X} = 1.04$). Revenue in the profit and loss statement, on the other hand, received the lowest average score of acceptance ($\bar{X} = 0.17$). Overall, the environmental report as proposed was accepted by the respondents with the overall average score of 0.65.

- Auditor's Report

The overall average score of this element was 0.54. The provider group had a slightly lower average score of acceptance than the user group. The reasons may include the companies would have higher costs in arranging environmental audit, and the users would like to have information audited by auditor.

- Balance Sheet - Assets

The overall average score was in the same level of previous element ($\bar{X} = 0.558$). The provider group also had slightly lower average score of acceptance than the user group.

- Balance Sheet - Liabilities

The overall average score was decreased to 0.44. The provider group had lower average score ($\bar{X} = 0.36$) of acceptance than the user group ($\bar{X} = 0.5$)

- Profit and Loss - Revenue

This element received the lowest average score among all elements ($\bar{X} = 0.17$). The provider group provided neither agreed nor disagreed with this element ($\bar{X} = 0.05$) while the user group had higher average score of 0.258.

- Profit and Loss - Expenses

The overall average score of this element was higher to 0.5. The provider group had almost half the average score of the user group ($\bar{X}_p = 0.35$ compared to $\bar{X}_u = 0.60$).

- Notes to Statements - Accounting Policies

The overall average score of this element was higher than the previous one ($\bar{X} = 0.63$). The provider group again had a lower average score than the user group.

- Notes to Statements - Environmental Policies

The overall average score was increased to 0.82. The provider group, for their first and only time, had higher average score than the user group. Environmental policies were considered as positive information by the companies. The companies may want to disclose this information for their own benefit while the users worried about the uncertainty of the policies.

- Notes to Statements - Environmental Plans

The overall average score was increased to 0.87. The provider group had the average score of 0.8 while the user group had the average score of 0.92.

- Notes to Statements - Environmental Projects

The overall average score remained at 0.889. The provider group had the average score of 0.76 which was lower than the user group.

- Notes to Statements - Law Conformity

This issue received the highest overall average score of 1.037. The provider group had the average score of 0.92 while the user group had the average score of 1.1.

- Notes to Statements - Contingent Liabilities

The overall average score was 0.7 which was decreased from the previous elements in notes to statements. The provider had the average score of 0.4 which was lower than half of the average score obtained by the user group ($\bar{X} = 0.89$).

Table 5-2 Opinion about Disclosure Pattern - Overall

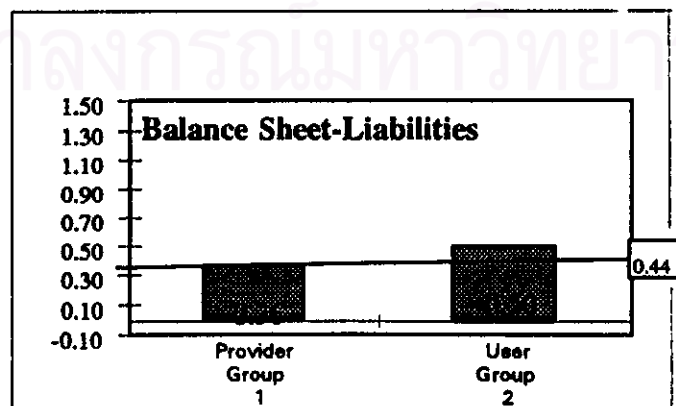
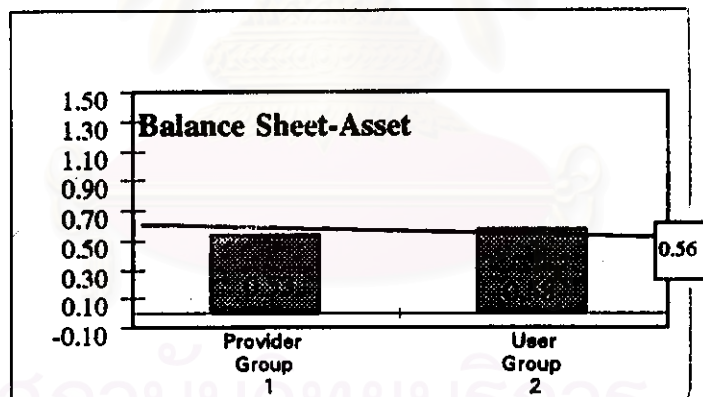
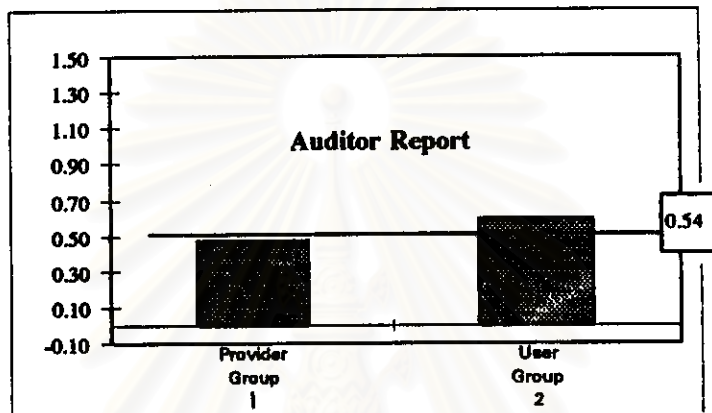


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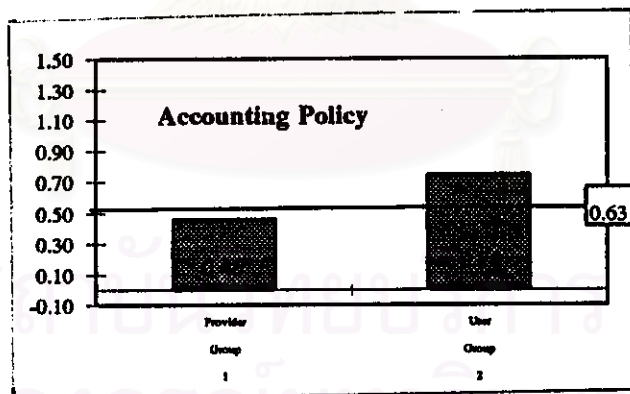
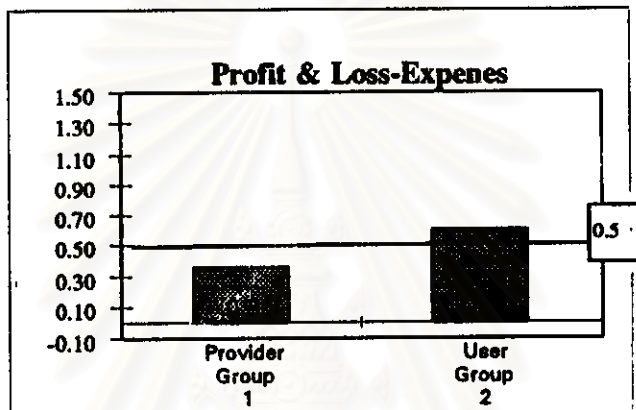
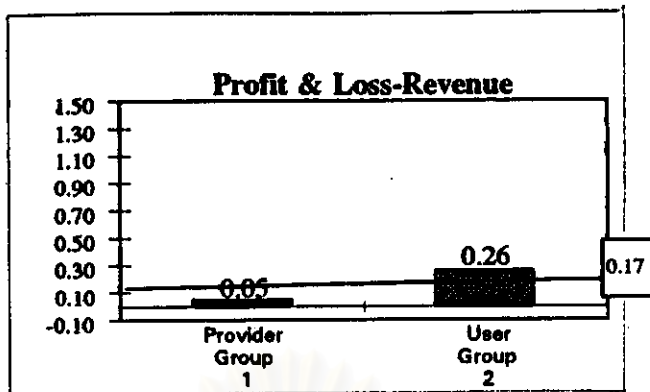
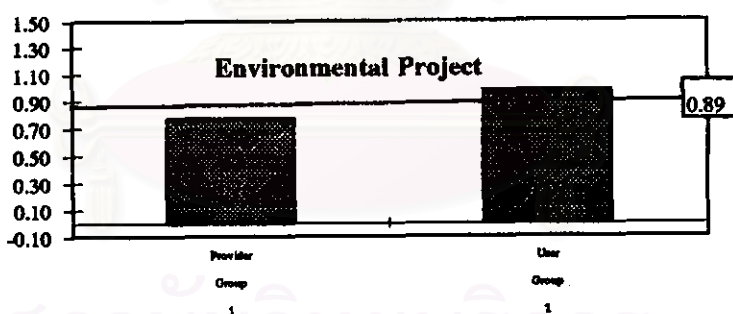
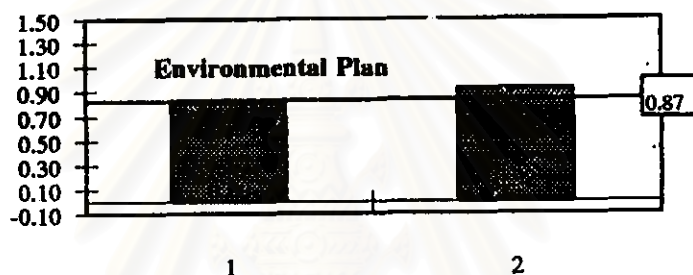
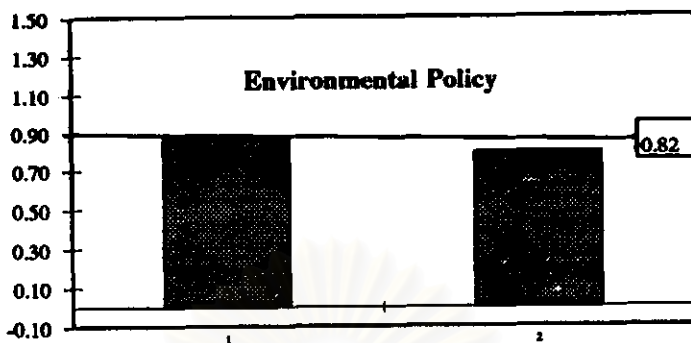
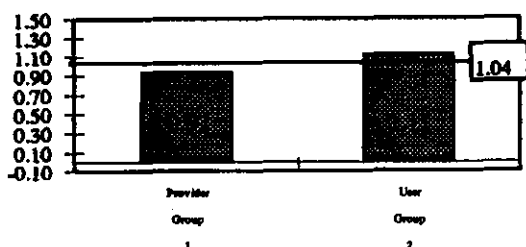


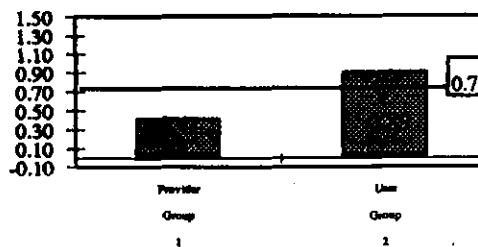
Table 5-2 (continue)



Law Conformity



Contingent Liabilities



In conclusion, the results show that the environmental report was supported overall. Law conformity in the notes to statements received the highest average score of support and revenue in profit and loss statements received the lowest average score of support. In the provider group, law conformity in notes to statements received the highest average score of support while revenue in profit and loss statement received the lowest average score of support. In the user group, law conformity in notes to environmental statements also received the highest average score of support and revenue in profit and loss statement also received the lowest average score of support. It is obvious that both the provider group and the user group want to see how companies comply with the laws and regulations. Liabilities including contingent liabilities and revenue have measurement problems and therefore obtained the lower average score of support.

There were some comments from both the provider group and user group (less than 50 percent of all respondents). The comments were separated into supportive and unsupportive schemes. The supportive reasons from both groups included: to encourage the business responsibility; to have clear presentation and to create a means to evaluate the performance; and to have standard for disclosure. The provider group provided an additional supportive reason of having benefit to trade. The user group provided an additional supportive reason of promoting the business image. On the other hand, the unsupportive reasons from both groups included: unnecessary to separate from financial statements; problem in measurement; and create more burdens and costs to the companies. The provider group provided additional unsupportive reason of being irrelevant to tax and too detailed. The user group provided an additional disagreeing reason of more details are needed in the area of liabilities in balance sheet and revenue and expenses in profit and loss statement.

There were also a number of suggestions from both the provider group and user group (less than 20 percent of all respondents). The suggestions from both groups included: the problem of measurement must be resolved; more detailed contents are required; and the format needs to be varied according to industry type. The provider group provided additional suggestions of the disclosure of whole project should be

included, and standards should be established. The user group provided additional suggestions that more details about scope, procedures, and date in the auditor's report should be included, the requirement of ISO 14000 should be applied to the disclosed information, the problems of allocation between environmental related and nonenvironmental related activities should be resolved, and tax incentive should be implemented.

5.3.4 Disclosure of Environmental Information

In summary, the overall disclosure level for environmental information (including environmental policies, plans, projects, law conformity, assets/expenses, benefits, and contingent liabilities) was calculated by averaging the disclosure scores, unweighted and weighted, obtained from each element of the environmental information.

In the provider group, the unweighted disclosure score was 1.468. The weighted disclosure score was 6.20. Electrical product and computer had the highest average score while food and beverage had lowest average score.

In the user group, the unweighted disclosure score was 2.387. The weighted disclosure score was 9.22. The creditor group had the highest average score and the community group had the lowest average score.

In the overall respondents, the unweighted average disclose score was 1.94 while the weighted disclosure score was 7.71. This results means that the disclosure of environmental information is desirable by both companies who are the information providers and the users of the information disclosed by the companies. The disclosure should be in the level that can identify its magnitude.

Table for unweighted and table for weighted in Appendix B-6 a and b present the results in detail.

5.3.5 Other Opinions on Environmental Issues

There were two issues that had also been asked of the respondents: whether environmental damage caused by businesses and whether companies would like to disclose environmental information voluntarily or compulsory. The study used the same scores as applied to the opinions about disclosure pattern. The scores were in the range from two to minus two. Two meant “strongly agree”, one meant “agree”, minus one meant “disagree”, and minus two meant “strongly disagree”.

- Environmental Damage

In the provider group, the average opinion was 1.045 which means that they agreed that business was one of the main factors causing the current environment to be severely damaged. Vehicles and parts industry provided the highest average score of support for this claim with $\bar{X} = 1.7$. Agribusiness provided neither agreed nor disagreed with this claim ($\bar{X} = 0$) which was the lowest average score.

In the user group, the average opinion was higher than the provider group ($\bar{X} = 1.2934$). The score could determine that the user group supported this opinion. Communities had the highest average score of support ($\bar{X} = 1.5$). Government agencies had the lowest average score, although it was slightly lower than communities' score ($\bar{X} = 1.107$).

In overall respondents, the average score was 1.195 which meant all respondents supported the claim that the current environment was damaged and business was one of the major causes.

Tables a, b, and c in Appendix B-7 present the results in detail.

- Voluntary and Compulsory

In the provider group, the average score was 0.55 which meant that they supported the idea that environmental information should be strictly enforced by law or standard to be disclosed rather than voluntarily disclosed by the firm. Household goods industry provided the highest average score of support ($\bar{X} = 1.33$). Three industries had neither agreed nor disagreed with this issue. Those industries included: food and beverage; health care service; and hotel and travel services.

In the user group, the average score was higher than the score obtained from the provider group. ($\bar{X} = 1.006$) which meant that they supported the idea of compulsory rather than voluntary disclosure. Communities had the highest average score of support of 1.25. Intermediaries had the lowest average score of 0.96.

In the overall respondents, the average score was 0.8267 which meant that the idea of compulsory disclosure was supported by all respondents. Tables a, b, and c in Appendix B-8 present the results in detail.

5.4 Empirical Analysis

Previous studies had concluded that firms were more willing to disclose positive information than negative information. However, the argument may be arisen that firms may also want to disclose negative information in the same manner as positive information in order to avoid shock impacts from the recipients of such information. Also, there were some conclusions that firms' environmental disclosures were associated with environmental performance, economic performance, stakeholder's influence, and other variables such as size, risk, and industrial type. The results of those studies were inconsistent and no comprehensive model that incorporates all mentioned variables was tested. This study has formulated the hypotheses to test whether those prior studies, conducted in the developed countries, hold true for the different countries like Thailand. Also, a comprehensive model of

environmental disclosures and its determinants has been constructed for empirically tested.

5.4.1. Positive and Negative Information

This study used the opinion to disclose environmental information from the provider group to represent the real disclosure of such information. The information in this study included policies, plans, projects, assets/expenses, law conformity, contingent liabilities, and benefits. The first three variables together with benefits were considered as positive information. Firms that maintained good policies, plans, projects or benefits related to environment were viewed to have competitive advantage over their competitors. Whereas, contingent liabilities were considered as negative information because it might cause the firm's image to be tarnished and reduce current net income when the liabilities were accrued or disclosed.

Law conformity could be considered as both positive and negative and so could assets/expenses. Firms did not comply with certain laws or regulations may consider this information as negative information while at the same time, firms that complied strictly with the laws may consider this information as positive information. In relation to assets/expenses, expenses should include expenditures to clean up the environmental problems created by the firms in the past or expenditures to repair or maintain the assets acquired for minimizing environmental problems. Assets could be costs spent for minimizing problem or preventing problems. Under the US guideline, assets mean cost incurred for the purpose to improve or develop the production system to prevent future pollution; and expenses mean costs incurred for the purpose to clean up the pollution the company created in the past. As a result, assets may be viewed as positive information whereas expenses may be viewed as negative information. However, there is no clear standard or guideline in Thai accounting practices. Recording as expenses or assets is mainly considered by its future benefits, not its purpose. Due to unclear evidence what would be the real practices of the companies, it was difficult to identify assets/expenses as positive or negative information at this

stage. This study, therefore, accounted for law conformity and assets/expenses information as either positive or negative in the sensitivity analysis.

From the analysis, the average disclosure of positive information was 1.54. The average disclosure of negative information was 1.45. The correlation of this two group was 0.622 and had statistically significant at 0.01 level. In the sensitivity analysis, when including law conformity and assets/expenses information to positive information, the average disclosure of positive information was increased to 1.56. The correlation between positive and negative information remained high and had statistically significant at 0.01 level. On the other hand, when including law conformity and assets/expenses to negative information, the correlation between positive and negative information was increased to 0.834 and statistically significant at 0.01 level. Therefore, the hypothesis of :

H_1 = Information providers tend to disclose positive information more than negative information could not be rejected. And therefore, it may be concluded that both positive and negative information were willing to be disclosed by information providers evenly. However, the positive information received a higher score in its willingness to be disclosed. Table 5-3 below shows the results of analysis.

Table 5-3 : Positive and Negative Information

Provider Group	Pos.	Neg.	r=	2 tail sig. (P=)	t-value	2-tail sig. (P=)
Positive/Negative (44 pairs)	$\bar{X}_P = 1.54$ SD = .93	$\bar{X}_N = 1.45$ SD = 1.25	0.622	** .000	-0.57	0.57
Positive (1)/ Negative (44 pairs)	$\bar{X}_P = 1.56$ SD = .93	$\bar{X}_N = 1.45$ SD = 1.25	0.604	** .000	-0.68	0.5
Positive/ Negative(1)(68 pairs)	$\bar{X}_P = 1.43$ SD = .79	$\bar{X}_N = 1.44$ SD = .92	0.834	** .000	-0.12	0.9

Positive = policies, plans, projects, benefits Negative = contingent liabilities

** Significant at 0.01

Positive (1) = policies, plans, projects, benefits, law conformity, assets/expenses
conformation, assets/expenses

Negative (1) = contingent liabilities, law

5.4.2. The Association between Disclosure and Some Characteristics

This study tied the relationship between firms' environmental performance, economic performance, and stakeholder's influence with the intention to disclose environmental information represented by the opinions from the provider group. The study used control variables of risk, size and industry. Also, this study used the companies' real disclosure in their annual reports to replace the firms' intention to disclose environmental information for comparison.

5.4.2.1 Characteristics of Provider Group

There were 19 industries included in this study. Environmental policies, plans, and projects provided by the respondents in each industry were summarized and ranked as illustrated in Table B-9. This information was combined to form a measure of environmental performance of the firms. In addition, the firms' total assets, debt to equity ratio, risk, average proportion of shares held by shareholders who had shares more than 10 percent of total shares and the effect of law imposed toward the firms are presented in Table B-10 for each industry group.

5.4.2.1.1 Environmental Performance

Environmental performance was formulated by combining environmental policies, plans, and projects that were replied by the firms' representatives. The environmental policies were questioned in different aspects: safety; saving energy; saving natural resources; replacement of natural resources; quality management; waste reduction; recycle; and eliminating pollution. The scores were in the range of zero to three. It can be interpreted as: zero meant "do not have"; one meant "be providing"; two meant "have partially"; and three meant "have that particular practice".

Among those policies mentioned earlier, the safety policy was the policy that most companies had already implemented. Quality management policy was the second

concern in most of the companies. Replacement of natural resources was the least important policy the firms were concerned.

Pharmaceutical products and cosmetics, pulp and paper, chemical and plastics, food and beverage, energy, and mining placed the policy of safety high in their strategy. Property development, although shown as the group with the lowest average score, placed a slightly lower importance in this policy.

For saving energy policy, pharmaceutical products and cosmetics, pulp and paper, food and beverage, electrical products and computer, energy, jewelry and ornaments, and mining fully implemented this policy. On the other hand, property development showed that they had the least concern in this policy.

Several groups provided the highest concern in the policy to save natural resources. The groups were comprised of pharmaceutical products and cosmetics, pulp and paper, hotel and travel services, electronic products and computer, energy, jewelry and ornament, and mining. On the other hand, packaging was the group that provided the least concern in this issue.

Replacement of natural resources, which had the least average concern among environmental policies, had several groups placed it high in their strategies. The groups included pharmaceutical products and cosmetics, pulp and paper, vehicle and parts, chemicals and plastics, electronic components, jewelry and ornaments, and mining. Two industries had the least concern: energy and packaging.

Several groups including pharmaceutical and cosmetic, printing and publishing, pulp and paper, vehicles and parts, food and beverage, electrical products and computer, energy, and jewelry and ornaments obtained the highest rank on quality management policy. Property development provided the least concern ($\bar{X} = 1.9$) in this practice.

Similar to quality management, several groups including pharmaceutical products and cosmetics, printing and publishing, vehicles and parts, chemicals and plastics, electrical products and computer, energy, and jewelry and ornaments had the highest rank in implementing waste reduction policy. On the other hand, property development had the lowest rank in this category.

The policy of recycling received the second lowest score following replacement for natural resources policy. Pharmaceutical products and cosmetics, chemicals and plastics and energy obtained the highest rank. Property development had the least score to implement this policy.

Eliminating pollution was highly conducted by pharmaceutical products and cosmetics, pulp and paper, chemicals and plastics, hotels and travel services, electronic components, energy, jewelry and ornaments, and mining. Property development had the lowest score.

Each of the environmental policies as categorized above was considered and given weight. The weight was given according to the importance of each policy toward environment by the opinion of an executive from the Office of Policy and Plan, the Ministry of Science, Technology and Environment. The policy of saving natural resources and quality management received the highest weight. Safety policy received the lowest weight. The weights of each policies were between two and five.

It is noticeable that policies that related directly to environment such as recycle, saving natural resource, and replace natural resource received lower scores in operation.

- Environmental Plans

Plans in this study included: establishing a division for environmental management; connecting policy of environmental management with other management policy, assigning responsibility and duty to manage environment clearly; complying

with ISO 14000; following-up and evaluating environmental plans regularly. The overall scores of these environmental plans were lower than the policies and projects because this part was specifically discussed in the environmental area.

Following-up and evaluating environmental plans regularly received the highest average score ($\bar{X} = 1.45$) among all plans mentioned above. Complying with ISO 14000 received the lowest average score ($\bar{X} = 0.68$).

In establishing division for environmental management, energy had the highest concern. Pharmaceutical products and cosmetics had the least concern in this item.

Mining obtained the highest score in implementing the plan to connect policy of environmental management with other management policy. On the other hand, vehicles and parts obtained the lowest average score in implementing this plan.

Mining also obtained the highest score in implementing the plan to assign responsibility and duty to manage environment clearly. Similar to the previous plan, vehicles and parts had the lowest score for this plan.

About the plan to comply with the ISO 14000, energy claimed as the leader in implementing this plan. Hotels and travel services and mining had the lowest average score for this plan.

Several groups had plans to follow-up and evaluate environmental plans regularly. The groups included: pharmaceutical products and cosmetics; pulp and paper; chemical and plastics; electrical products and computers; energy; jewelry and ornaments; and mining. Vehicles and parts had the lowest average score.

The importance weight for each categories of the environmental plans was also given and reviewed. The weights for each category were relatively high. Connecting policy of environmental management with other management policy and complying

with ISO 14000 received the highest weight among the environmental plans. Following-up and evaluating environmental plans regularly received the lowest weight.

- Environmental Projects

The projects in this study were divided into two groups: marketing and operating perspectives. In marketing, the projects included: products are environmental friendly; having safety instructions; decreasing size without losing effectiveness and efficiency; packaging can be recycled or refilled; packages can be analyzed; using packages that reduce garbage; using environment in public relation or advertisement. In operating, the projects included: system of waste-water treatment; system of eliminating waste; system of eliminating air pollution; system of saving energy; system of saving natural resources; system of quality control; safety system; maintenance system; system to replace natural resources; decreasing waste; decreasing cost of goods manufactured; decreasing noise pollution.

- Marketing Perspective

In the marketing perspective, most industries had their products be environmentally friendly and ranked its importance higher than other marketing projects. Packaging can be recycled or refilled was the projects that received the least concern.

Many industries claimed that their products were environmentally friendly. The groups included: pharmaceutical products and cosmetics; vehicles and parts; chemicals and plastics; health care services; hotels and travel services; electrical products and computer; energy; and mining. Jewelry and ornaments had the lowest score in this subject.

Five industries included: vehicles and parts; chemicals and plastics; health care services; hotels and travel services; and electrical products and computer claimed to have high concern on safety instruction. Textiles clothing and footwear had the least

score in providing safety instruction. Printing and publishing; electronic components; energy; and mining stated that their products were not related to this item.

Several industries stated that they had reduced size of their product without losing effectiveness or efficiency. The group included: printing and publishing; vehicles and parts; health care services; electrical products and components; and electronic components. Household goods and building and furnishing materials received low score in this category. Some industries declared that they were not related to this issue. The group included: energy; jewelry and ornaments; mining; and packaging.

Pulp and paper; health care services; and electrical products and computers provided that their packaging can be recycled or refilled. Electronic components and household goods provided the least score in this issue. Property development, energy, and mining claimed that this issue was not pertinent to them.

Packaging can be analyzed in biological experiment in the firms from these following industries: pharmaceutical products and cosmetics; pulp and paper; jewelry and ornaments. This issue was ranked low in vehicles and parts. Property development, energy, and mining claimed that they were not related to this issue.

Printing and publishing; vehicles and parts; and building and furnishing materials provided that their packages would not cause garbage. On the other hand, pharmaceutical products and cosmetics and household goods admitted that its packaging can cause garbage.

Printing and publishing and mining included environment in their public relation. Jewelry and ornaments; agribusiness; and food and beverage did not apply or slightly applied this issue.

Hotels and travel services agreed that they used the environment issue to differentiate themselves from their competitors. Food and beverage; jewelry and

ornaments; and mining provided that they did not use the environment to differentiate themselves from their competitors.

The importance weight for each category of the environmental projects in marketing perspective was given and reviewed by an executive from the Ministry of Science, Technology and Environment. "Products are environmental friendly" received the highest weight. On the other hand, "reducing the size without losing its effectiveness and efficiency" received the lowest weight.

- Production Perspective

In the production perspective, the highest average score can be seen in the system to decrease waste. On the contrary, the lowest average score was obtained from the system to replace natural resources.

In the waste-water treatment system, pharmaceutical products and cosmetics; textiles, clothing and footwear; vehicles and parts; and chemicals and plastics; electrical products and computers; electronic components; energy; household goods; jewelry and ornaments; and mining claimed that they had better systems than the law required.

The pharmaceutical products and cosmetics; chemicals and plastics; electrical products and computers; energy; jewelry and ornaments; and mining provided that they had better systems to eliminate waste. Average score for this category was rather high. Pulp and paper was the group to have the least concern in this issue.

Many groups claimed that they had better system to eliminate air pollution. Those groups included: Pharmaceutical products and cosmetics; printing and publishing; chemicals and plastics; electrical product products and computer; jewelry and ornaments; and mining. Pulp and paper and energy were groups with the lowest average score in this concern.

In the system of saving energy, pharmaceutical products and cosmetics; pulp and paper; energy; and mining claimed that they had such system. Property development and chemicals and plastics had the lowest average score but an insignificant difference from the highest score.

Many industries claimed that they had better systems in saving natural resources. These industries included: pharmaceutical products and cosmetics; printing and publishing; pulp and paper; food and beverage; health care services; agribusiness; hotel and travel services; energy; jewelry and ornaments; mining; and household goods. The remaining industries included: property development; textiles, clothing and footwear; vehicles and parts; vehicles and parts; chemicals and plastics; building and furnishing materials; electrical products and computers; electronic components; and packaging had lower scores in this issue.

Several industries implemented the system of quality control at a high level. The industries included pharmaceutical products and cosmetic and printing and publishing. Energy was the group that had the lowest score in this issue.

Not surprisingly, the average score for the issue of safety systems in the factory was rather high. More than half of the industry groups reported that they had a better safety system. The lowest score was obtained from health care services.

Maintenance system was also received a high average score. About half of the industry groups reported that they had a better system. Property development had the lowest score in this issue.

The lowest average score was obtained from the category of replacement of natural resources. Two industries stated that they had developed this project: pharmaceutical products and cosmetics and mining. Energy responded that it had no such project.

Fifteen out of nineteen industries provided that they had better systems in decreasing waste. The remaining industries provided that they have partial or no operation. These groups included: property development; vehicles and parts; hotels and travel services; and packaging.

The average score of decreasing cost of goods manufactured was also high. Several industries included pharmaceutical products and cosmetics; chemicals and plastics; hotels and travel services; electrical products and computers; energy; jewelry and ornaments; and mining provided the highest score. Property development had the lowest score in this issue.

The weight, for environmental projects in an operating perspective had been given. Systems of saving energy; and systems of saving natural resources received the highest weight. Decreasing noise pollution, on the other hand, received the lowest weight.

Environmental performance had an average unweighted score of 1.96. Mining was ranked number one according to its highest average score ($\bar{X}= 2.65$). Energy was ranked number two and electrical products and computer was number three with slightly different score. Health care service was the last group in the chart. Packaging and food and beverage showed slightly better average score than health care service in their environmental performance.

Using the weight provided by an executive from the Ministry of Science, Technology, and Environment, the average score of environmental performance was 7.13. Mining was still number one in the chart ($\bar{X}= 9.03$). The group following up was the energy group with a score of 8.69. The third rank was electrical products and computer. Packaging was the last group in the chart. Food and beverage, and health care services were in a better position than packaging.

Environmental performance was represented by "ENPERF;" in this analysis. The table in Appendix B-9 presents the details of environmental performance.

It is noticeable that projects that related directly to the environment such as recycle, saving natural resource, and replace natural resource received lower scores in operation.

5.4.2.1.2 Economic Performance

This study used a three-year average of return-on-investment [ROI] to represent a firm's economic performance. The ROI was calculated using the net income or loss from the operation adjusted with the effect of a change in accounting method divided by total assets for the past three years from 1994 to 1996.

The average mean of ROI for all responses was 0.0496. Electronic components received the highest average ROI at 0.12. Pharmaceutical products and cosmetics received the second rank with average ROI of 0.097. Property development received the third rank with average ROI of 0.093. Two industries showed negative figures. They included mining with the average ROI of -0.058 and household goods with an average ROI of -0.029.

Economic performance was represented by " FIN_i " in this analysis.

5.4.2.1.3 Stakeholder's Influence

This study identified stakeholders as creditors, government agencies, and shareholders. The influence from creditors to a firm was measured by the ratio of debt-to-equity. The influence from government agencies was measured by the impact of a company's operation in relation to the environment. The influence from shareholders was measured by the proportion of shares held by a shareholder who owned more than 10 percent of total shares.

- Creditor's Influence

Debt-to-equity ratio was used as a surrogate of creditor's influence. The average debt to equity ratio of the entire sample was 1.298. Jewelry and ornaments had the highest debt-to-equity ratio ($\bar{X}= 2.82$). Building and furnishing material also had high debt-to-equity ratio ($\bar{X}= 2.286$). Food and beverage received the third rank with average debt-to-equity ratio of 1.955. Household goods received negative debt-to-equity ratio of -0.42. The best of the group, energy had the lowest ratio of debt-to-equity ($\bar{X}= 0.387$). Hotels and travel services had higher ratio of debt-to-equity ($\bar{X}= 0.48$). Mining had a slightly higher score than the previous group ($\bar{X}= 0.655$).

Creditor's influence was represented by "CREDIT;" in this analysis.

- Government Agency's Influence

This study measured government agency's influence by considering the involvement of firm's operation and production in the area of air, water, garbage and noise.

The measurement started with considering whether each firm's operation or manufacturing related to which of the above four areas. The review of each firms' operation or manufacturing in the information of listed companies was conducted. In addition to the review, the opinions from the Stock Exchange of Thailand and The Securities and Exchange Commission were obtained. As a result, one score in each area was obtained if the firms' operation or manufacture related to that area, otherwise a zero score was obtained.

In addition, the laws or regulation related to the area of air, water, garbage, and noise were reviewed with the assistance of an executive from the Law Office of the Ministry of Science, Technology, and Environment. It was concluded that the majority (approximately 65 percent) of laws related to environment are issued with regard to

water pollution. The second concern of the environmental laws and regulation were related to air pollution (approximately 30 percent). The environmental laws or regulation for noise pollution and garbage received substantially less concern than the first two area (approximately five percent each). Therefore, the following weights were given for air area; for water area; for garbage area; and for noise area.

Area	Weight (percent)
Water	61.9
Air	28.5
Garbage	4.8
Noise	4.8

The average score for government influence to overall groups was 0.377. Agribusiness received the highest score in relation to government influence ($\bar{X}=0.735$). The second group in the range that had a high score was vehicles and parts ($\bar{X}=0.667$). Then, the third rank was electronic components ($\bar{X}=0.635$). Two industries received no effect from pressure from government agency. They were pharmaceutical products and cosmetics and jewelry and ornaments. Another low score was obtained in hotels and travel services ($\bar{X}=0.009$).

Government's influence was represented by "GOV_i" in this analysis.

- Shareholder's influence

The shareholder's influence was measured by the proportion of common shares and average shareholders who held more than 10 percent of total common shares. The percentage of shares held by the ten largest shareholders of each firm were obtained from SIMS of the Stock Exchange of Thailand. The data was posted as at December 1996.

The average percentage of shares held by each individual who owned more than 10 percent of total common shares was 21.57. Energy had the highest percentage

of 59.56. Packaging was the second in having high average percentage of shares owned by major shareholders ($\bar{X}= 36.41$). Pulp and paper was the third ($\bar{X}= 32.95$). Health Care services had distributed its shares to small shareholders and the average percentage shares held by a major shareholders was 10.76. Jewelry and ornaments was the second in wide distribution of its shares and its major shareholder held 11.78 percent of total shares.

Shareholder's influence was represented by "SHARE_i" in this analysis.

5.4.2.1.4 Risk

The company's risk was obtained by β (beta) value in the market model calculated upto December 1996. The market model is simplified as :

$$R_i = a + b R_m + E_i$$

while R_i = return of the firm

R_m = return of the market

$$\text{while } R_i = \frac{(P_t - P_{t-1} + D_t)}{P_{t-1}}$$

P_t = Price of the stock at time t

P_{t-1} = Price of the stock at time t - 1

D_t = Dividend paid at time t

$$R_m = \frac{\text{SET index}_t - \text{SET index}_{t-1}}{\text{SET index}_{t-1}}$$

$$\text{SET index}_t = \frac{\text{weighted price of all stock at time t}}{\text{weighted price of all stocks at 30 April 1975} \times 100}$$

This study used the information of beta calculated by S-ONE, a finance company. The calculation used the above formulation and obtained the data including from the date of the stock started trading to December 26, 1996. There was no significant change in stock trading during December 26, 1996 to December 30, 1996.

The average risk of overall samples was 0.532. Energy had the highest risk ($\bar{X}=1.15$). Property development was the second highest in having high risk ($\bar{X}=1.03$). And electronic components was the third in the chart to have high risk ($\bar{X} = 0.917$). Pharmaceutical products and cosmetics had negative risk ($\bar{X}= -0.08$). Also, hotels and travel services had negative risk ($\bar{X}= -0.0$). Vehicles and parts had the lowest positive risk ($\bar{X}= 0.135$).

Risk was represented by " RISK_i " in this analysis.

5.4.2.1.5 Size

Size of a firm has been represented by total assets or revenue in most other studies. This study collected both information as at and for the year ended December 1996 from SIMS system of the Stock Exchange of Thailand. Both sets of information were later checked for their correlation and one variable was eliminated. The criteria to eliminate was that if the high correlation was found (more than 0.80), the one that had the higher correlation to disclosure level would represent size in this study.

In relation to total assets, the average total assets of all samples was 5,871.75 million Baht. Energy was the biggest group with total assets of 18,720.1 million Baht. Building and furnishing material was the second biggest group with total assets of 12,980.1 million Baht. The third biggest group was property development with average total assets of 12,479.8 million Baht. Pharmaceutical products and cosmetics was the smallest group in terms of average total assets ($\bar{X}= 798.1$ million Baht). Packaging was the second lowest with total assets of 1,389 million Baht. And printing and publishing was slightly bigger than the previous group with average total assets of 1,442.4 million Baht.

In relation to revenue, the average revenue for the whole group was 2,495.7 million Baht. Building and furnishing materials had the largest average revenue of 7,431 million Baht. The second largest group was chemicals and plastics with average revenue of 4,713.8 million Baht. The third largest group was electronic components

with average revenue of 3,950.7 million Baht. The industry with the least average revenue (570.4 million Baht) was hotels and travel services. Pharmaceutical products and cosmetics had slightly higher average revenue (648.7 million) than hotel and travel services. And the third least, vehicles and parts had average revenue of 853.2 million Baht.

Size was represented by "SIZE-TA_i" for total assets and "SIZE-REV_i" for revenue in this analysis.

A table in Appendix B-10 presents the details of the firms' characteristics.

5.4.2.2 Weight for Information Provider's Representation

In order to perform statistical tests in this study, the intention to disclose environmental information from the information provider was considered to represent a firm's disclosure. For firms for whom responses from both finance/accounting and administration were obtained, both responses were combined using weights calculated by the opinion provided by all responses from the provider group. The weights for finance/accounting and administration were as follows :

	<u>Weight</u>
Finance/ Accounting	3.1429
Administration	4.5505

For firms where only one response was received, that response was recognized as that firm's representative.

Besides disclosure, information about a firm's environmental performance was asked in the questionnaire. This information included environmental policies, plans, and projects related to marketing and operation. Information from the one with a higher level of management was recognized as the firm's representative. For firms that

both finance/accounting and administration were in the same level of management, the answer from finance/accounting was recognized as the firm's representative.

5.4.2.3 Correlation among variables - Unweighted

Disclosure in this study was comprised of elements of policies, plans, projects, law conformity, assets/expenses, benefits and contingent liabilities. This study used the raw score obtained from each element and combined to derive to a disclosure score. This disclosure score was the dependent variable while government's influence, total assets, total revenue, average ROI, debt-to-equity ratio, risk, proportion of shares, and environmental performance were independent variables. The results showed that disclosure had no statistical significance at 0.05 in association with all independent variables. It correlated most with the proportion of shares ($r = 0.2$). The second variables that correlated positively with disclosure was environmental performance ($r = 0.09$). Disclosure had the least correlation with debt to equity ratio ($r = -0.02$). Disclosure had negative correlation with total assets, total revenue, average ROI, debt-to-equity ratio, risk and government's influence. Total assets and revenue were highly correlated and represented the same variable - size. Total assets also correlated with debt-to-equity ratio with statistical significance at 0.01. Total assets also correlated with risk with statistical significance of 0.01. Debt-to-equity ratio associated with risk with statistical significance of 0.05. A table shows the details of correlation in Appendix B-11.

5.4.2.4 Correlation among Variables - Weighted

Disclosure was the dependent variable while government's influence, total assets, total revenue, average ROI, debt-to-equity ratio, risk, proportion of shares, and environmental performance were the independent variables. This study weighted the score obtained in each element of disclosure (dependent variable) by the importance weight obtained from all responses as presented in the previous section of this chapter. Disclosure had negative correlation with government's influence, total assets, total revenue, average ROI, debt-to-equity ratio, and risk. Disclosure had association with

proportion of shares at a statistical significance of 0.05. It had no association with other variables at the statistical significance level of 0.05.

Considering only the independent variables, total assets was highly correlated with revenue. Those two variables were used to represent the same variable - the firm's size. This study, therefore, cut revenue from the set of independent variables because total assets had slightly higher correlation with disclosure than total revenue. Other inter-correlated variables were as follows :

1. Total assets and debt-to-equity ratio had statistical significance at 0.01.
2. Total assets and risk had statistical significance at 0.01.
3. Debt-to-equity ratio and risk had statistical significance at 0.05.

A table shows the details of correlation in Appendix B-12.

5.4.2.5 Univariate Analysis

As mentioned earlier, the disclosure has statistical significance at 0.05 in association with proportion of shares, a surrogate of shareholder's influence. Therefore, only hypothesis four which is "firms that encounter more pressure from their stakeholder in the aspect of shareholder's influence does not tend to disclose more information" can be rejected. Other hypothesis cannot be rejected due to no statistical significance at the 0.05 level.

Table 5-4 in Section 5.4.3.1 presents the correlation of disclosure (unweighted and weighted) and each hypothesized variable.

5.4.2.6 Multivariate Analysis

The disclosure used in this study was summarized from the intention to disclose environmental information: policies, plans, projects, law conformity, contingent

liabilities, assets/expenses, and benefits. In this test, the unweighted disclosure and weighted disclosure were used. The results are presented in Table 5-5.

Table 5-5 a) Disclosure - Unweighted												
	(Constant)	ENPERF	FIN	GOV	SHARE	CREDIT	SIZE-TA	RISK	Mult. R	R Square	Mean Sq/ Coef. of Var.	F-value (p)
Predicted Sign		(+)	(+)	(+)	(-)	(+)	(+)	(+)				
Whole Population												
Raw Data	1.079	0.031587	-0.93797	-0.1749	0.014183	0.031739	-8.3E-06	-0.0238	0.2603	0.06775	0.71923	0.82022
Standardized		0.061367	-0.08455	-0.07609	0.222633	0.048884	-0.11081	-0.01285			56.9%	(0.5734)
t-Value	2.199*	0.552	-0.751	-0.691	2.003*	0.418	-0.909	-0.105				
Table 5-5 b) Disclosure - Weighted												
Whole Population												
Raw Data	2.155678	0.062423	-2.23254	-0.3597	0.030502	0.069929	-1.7E-05	-0.02933	0.27494	0.07559	2.92614	0.92288
Standardized		0.059872	-0.09936	-0.07726	0.236384	0.053172	-0.11202	-0.00782			56.6%	(0.4936)
t-Value	2.178*	0.54	-0.886	-0.704	2.136*	0.456	-0.923	-0.064				

* Significant at 0.05

The regression analysis was applied and resulted in an unweighted $R^2 = .068$ and weighted $R^2 = .076$. The coefficient of variation was high at 56.9 percent for unweighted and 56.6 percent for weighted. It was evident that the model had weak power in explaining. The equation from this study was:

$$\text{Unweighted: Disc} = 1.08 - .175 \text{ Leffect} + .032 \text{ Enperf} + .014 \text{ Propsh} + .032 \text{ DE} - .938 \text{ AvgROI} - .00 \text{ TA} - .024 \text{ Risk}$$

$$\text{Weighted: Disc} = 2.156 - .359 \text{ Leffect} + .062 \text{ Enperf} + .031 \text{ Propsh} + .069 \text{ DE} - 2.233 \text{ AvgROI} - .00 \text{ TA} - .029 \text{ Risk}$$

5.4.2.7 Summary by Each Elements of Disclosure

The disclosure was broken down to elements : environmental policies, plans, projects, law conformity, assets/expenses, benefits, and contingent liabilities. Contingent liabilities received the highest R^2 of 0.219 while environmental policies received the lowest R^2 of 0.045. When analyzing the coefficient of variation,

contingent liabilities had the highest percentage of 83.6 while environmental plans had the lowest score of 57.2%. Each element was poorly explained the model.

Table 5-6 shows the results and the equations obtained from each element.

	(Constant)	ENPERF	FIN	GOV	SHARE	CREDIT	SIZE-TA	RESK	Mult. R	R Square	Mean Sq/ Coef. of Varl	F-Value(p)
Predicted Sign		(+)	(+)	(+)	(-)	(+)	(+)	(+)				
Environmental Policies												
Raw Data	0.735429	0.082383	0.023696	-0.1335	0.004992	0.078515	-8.2E-06	0.082777	0.21115	0.04458	0.79902	0.49997
Standardized		0.151643	0.002096	-0.05616	0.076673	0.11838	-0.10708	0.040839			60.4%	(0.8317)
t-Value	1.364	1.311	0.018	-0.489	0.663	0.976	-0.848	0.326				
Environmental Plans												
Raw Data	0.524689	0.114023	-1.24173	-0.21866	0.010143	0.025305	-3E-06	-0.01711	0.31579	0.09973	0.6783	1.12355
Standardized		0.226432	-0.07566	-0.09628	0.164053	0.035676	-0.04276	-0.00942			57.2%	(0.3582)
t-Value	0.953	1.958*	-0.557	-0.807	1.402	0.264	-0.325	-0.072				
Environmental Projects												
Raw Data	0.51546	0.080159	-0.18952	-0.10696	0.010107	0.11914	-6.2E-06	-0.0585	0.28673	0.08222	0.7375	0.71665
Standardized		0.160839	-0.01892	-0.04615	0.176643	0.203344	-0.09323	-0.03159			62.2%	(0.6582)
t-Value	0.924	1.223	-0.143	-0.35	1.339	1.461	-0.653	-0.222				
Law Conformity												
Raw Data	0.843335	0.026276	-0.65309	-0.26235	0.016316	0.123633	-1.1E-05	0.072581	0.29273	0.08569	1.03855	0.74977
Standardized		0.045893	-0.05496	-0.09685	0.238554	0.177619	-0.13347	0.033071			72.2%	(0.6312)
t-Value	1.308	0.352	-0.416	-0.743	1.818	1.283	-0.947	0.237				
Assets/Expenses												
Raw Data	1.20264	0.060031	-1.84585	-0.08841	0.004599	-0.01854	-1E-05	0.135345	0.24422	0.05964	1.23867	0.4168
Standardized		0.095138	-0.15253	-0.02955	0.066423	-0.02504	-0.13045	0.056619			67.9%	(0.8869)
t-Value	1.553	0.657	-1.025	-0.202	0.452	-0.163	-0.827	0.359				
Benefits												
Raw Data	1.035206	0.026378	-2.15542	-0.26005	0.021168	-2.6E-06	-6E-06	-0.1023	0.34122	0.11643	1.06595	0.97888
Standardized		0.045361	-0.17933	-0.09167	0.288116	-3.7E-06	-0.07588	-0.04521			71.7%	(0.4566)
t-Value	1.561	0.34	-1.333	-0.667	2.097*	0	-0.519	-0.314				
Contingent Liabilities												
Raw Data	1.616794	-0.14052	0.332537	-0.93663	0.033091	0.270152	-2.4E-05	0.455786	0.46815	0.21916	1.44879	1.44347
Standardized		-0.17917	0.013047	-0.26023	0.343977	0.267511	-0.29172	0.169559			83.6%	(0.2187)
t-Value	1.509	-1.18	0.071	-1.605	2.231*	1.399	-1.654	1.005				

* Significant at 0.05

5.4.2.8 Study Controlled by Industry

In order to see the results in a different perspective, this study separated the responses into five groups of industries according to their impact on the environment as identified by executives from the Stock Exchange of Thailand and the Securities and Exchange Commission (Leffect). The classification began by calculating the mean of government's influence (Leffect) for firms in each industry group. Those means were ranked from high to low. Then, the group was recategorized into five groups with the number of each group containing not less than 15 respondents. Table 5-7 shows the details of each group.

Table 5-7: Group according to environmental impact

Group	Industries
1	2, 17,12,13,19,3 (Pharmaceutical Products & Cosmetic, Jewelry & Ornaments, Hotel & Travel Services, Electrical Products & Computer, Packaging, and Printing & Publishing)
2	16, 5, 18 (Household goods, Textile Clothing & Footwear, and Mining)
3	11, 1 (Building & Furnishing Materials, Property Development)
4	15, 4, 8 ,9 (Energy, Pulp & Paper, Food & Beverage, and Health Care Services)
5	7, 14, 6, 10 (Chemicals & Plastics, Electronic Components, Vehicles & Parts, and Agribusiness.

The results of unweighted and weighted disclosure for each group are presented as follows:

Table 5-8 Disclosure by Industry Group

	(Constant)	ENPERF	FIN	GOV	SHARE	CREDIT	SIZE-TA	RISK	Mult. R	R Square	Mean Sq/ Coeff. of Var.	F-Value (p)
Predicted Sign		(+)	(+)	(+)	(-)	(+)	(+)	(+)				
Industry 1 - Unweighted												
Raw Data	1.124984	-0.03577	8.070386	-0.31968	0.000705	0.160966	-4.7E-05	0.690979	0.36708	0.13474	1.48537	0.20022
Standardized		-0.0586	0.33089	-0.06809	0.010548	0.188029	-0.09035	0.338388			79.1%	(0.9772)
t-Value	0.429	-0.15	0.688	-0.197	0.026	0.425	-0.237	0.816				
Industry 1 - Weighted												
Raw Data	2.454569	-0.09821	15.60982	-4.04996	0.001689	0.336099	-8.6E-05	1.419001	0.35439	0.12559	6.65022	0.18467
Standardized		-0.07644	0.304069	-0.05055	0.011995	0.186527	-0.07807	0.330156			82.1%	(0.9817)
t-Value	0.442	-0.194	0.628	-0.146	0.03	0.419	-0.204	0.792				
Industry 2 - Unweighted												
Raw Data	2.935499	-0.14457	-1.07443	0.533871	-0.03365	0.05627	-4.9E-07	-0.19885	0.72899	0.53142	0.12663	1.62015
Standardized		-0.48298	-0.36711	0.482486	-0.67954	0.190811	-0.00325	-0.1987			27.2%	(0.2358)
t-Value	4.225**	-1.958	-0.637	1.566	-2.231*	0.328	-0.009	-0.619				
Industry 2 - Weighted												
Raw Data	6.055046	-0.30726	-3.1643	0.974111	-0.06859	0.167173	4.77E-07	-0.43919	0.72131	0.52029	0.5549	1.54941
Standardized		-0.49616	-0.52258	0.42552	-0.66946	0.274002	0.001526	-0.21213			28.4%	(0.2556)
t-Value	4.163**	-1.988	-0.896	1.365	-2.173*	0.466	0.004	-0.653				
Industry 3 - Unweighted												
Raw Data	1.520042	0.056458	-1.92044	0.572801	0.020095	-0.03777	-1.2E-05	-0.79871	0.76124	0.57948	0.46376	2.16545
Standardized		0.144421	-0.09003	0.192512	0.294996	-0.06037	-0.29913	-0.44437			45.7%	(0.1214)
t-Value	1.211	0.55	-0.359	0.894	1.136	-0.244	-1.043	-1.439				
Industry 3 - Weighted												
Raw Data	2.935993	0.119924	-4.67097	0.976653	0.045204	-0.05348	-2.5E-05	-1.55139	0.78982	0.62382	1.54435	2.60594
Standardized		0.158994	-0.11349	0.170126	0.343945	-0.0443	-0.3189	-0.44736			41.3%	(0.0755)
t-Value	1.281	0.64	-0.479	0.836	1.4	-0.189	-1.176	-1.532				
Industry 4 - Unweighted												
Raw Data	2.2999	0.128148	-13.7917	0.817729	-0.01074	-0.51355	0.00011	-2.12722	0.67646	0.4576	0.64272	0.84367
Standardized		0.255603	-0.79984	0.410688	-0.26999	-0.81405	0.914375	-0.9686			54.9%	(0.5859)
t-Value	1.253	1.029	-1.465	1.029	-0.399	-1.397	1.336	-1.705				
Industry 4 - Weighted												
Raw Data	4.457628	0.214096	-23.7374	1.614485	-0.0251	-0.89557	0.000242	-4.08639	0.66718	0.44512	2.58824	0.8022
Standardized		0.215234	-0.69385	0.408683	-0.31797	-0.71551	1.011452	-0.93783			54%	(0.6107)
t-Value	1.21	0.517	-1.256	1.012	-0.464	-1.214	1.461	-1.632				

	(Constant)	ENPERF	FIN	GOV	SHARE	CREDIT	SIZE-TA	RISK	Mult. R	R Square	Mean Sq/ Coeff. of (p) Var.	F-Value
Predicted Sign		(+)	(+)	(+)	(-)	(+)	(+)	(+)				
Industry 5 - Unweighted												
Raw Data	0.323164	0.114381	-2.75894	-1.05643	0.040823	0.107115	3.43E-05	0.343663	0.74276	0.5517	0.95231	1.75807
Standardized		0.144584	-0.14432	-0.3481	0.407316	0.099743	0.135025	0.130656				59.1% (0.2017)
t-Value	0.18	0.612	-0.433	-1.231	1.642	0.349	0.412	0.5				
Industry 5 - Weighted												
Raw Data	0.265589	0.23892	-5.05735	-1.97239	0.085597	0.263092	7.97E-05	0.730734	0.74814	0.55972	3.83972	1.8161
Standardized		0.149053	-0.13056	-0.32076	0.421514	0.120909	0.154818	0.137112				58.8% (0.1891)
t-Value	0.074	0.636	-0.395	-1.145	1.715	0.427	0.477	0.529				

There was no significant difference between unweighted and weighted disclosure. For group one, the R^2 was lower than the other groups. The R^2 for group two to five were around 0.5. The coefficient of variation was lower when compared with overall from the previous analysis. The second group had the lowest coefficient of variation while the first group had the highest number. The signs of the independent variables in the model were mixed: negative in some groups and positive in others.

5.4.3 Association with Some Characteristics - Real Disclosure

The real disclosure in annual reports of the firms which responded to this study was reviewed. From chapter 3 section 3.1.1, the real disclosed firms counted as 20 percent of all firms; 23 out of 59 firms disclosed the environmental information and also returned questionnaires. This study used those 23 firms as the samples for analysis of the model and comparing to prior studies in this chapter. The disclosures of each firm were categorized into environmental policies, plans, projects, assets/expenses, benefits, law conformity, and contingent liabilities and marked if the disclosure fell in any category. Then the points in each category were summed and weighted using the importance weight obtained from the overall sample.

5.4.3.1 Correlation among Variables - Real Disclosure

Real disclosure was associated with total assets at a statistical significance at the level of 0.05. The association between disclosure and total asset had statistical significance at the level of 0.05. Also the association between disclosure and proportion of shares had statistical significance at nearly 0.05 (0.055). Other variables had no statistical significance at the level of 0.05. Table 5-5 shows the coefficients of correlation.

Table 5-4 : Correlation between Variables and Disclosures

	IDISC		IDISC1		R-DISC	
	Corr	2 - tail Sig	Corr	2 - tail Sig	Corr	2 - tail Sig
SIZE-TA	-0.073	0.499	-0.068	0.525	0.198	*0.047
SIZE-REV	-0.072	0.502	-0.069	0.519	0.147	0.144
SHARE	-0.081	0.452	-0.096	0.373	-0.034	0.732
CREDIT	-0.019	0.857	-0.017	0.875	-0.013	0.898
RISK	-0.026	0.814	-0.017	0.879	0.173	0.087
SHARE	0.199	*0.062	0.212	0.046	0.092	*0.055
ENPERF	0.093	0.387	0.092	0.391	0.13	0.194
GOV	-0.055	0.607	-0.055	0.608	0.038	0.705

* Significant at 0.06

IDISC = Unweighted disclosure

R-DISC = Real disclosure

IDISC1 = Weighted disclosure

5.4.3.2 Multivariate Analysis

The R^2 of this study was 0.11. The equation of this study was

$$\text{DISC} = -1.362 + 0.1966 \text{ Enperf.} - 0.706 \text{ Avg.ROI} + 0.025 \text{ Propsh} - 0.0915 \text{ DE} + 0.231 \text{ Leffect} + .00 \text{ TA} + 0.628 \text{ Risk.}$$

Table 5-21 shows the details.

Table 5-9 Real Disclosure

	(Constant)	ENPERF	FIN	GOV	SHARE	CREDIT	SIZE-TA	RISK	Mult. R	R Square	Mean Sq/ Coeff. of Var.	F-Value (p)
Predicted Sign		(+)	(+)	(+)	(-)	(+)	(+)	(+)				
Whole Population												
Raw Data	-1.36156	0.196627	-0.70586	0.23071	0.025483	-0.09151	2.96E-05	0.628205	0.33384	0.11145	4.32017	1.63052
Standardized		0.151916	-0.04299	0.039176	0.155853	-0.05345	0.148816	0.151241				199.9% (0.1368)
t-Value	-1.236	1.512	-0.423	0.386	1.539	-0.509	1.362	1.42				

The R^2 is still low. The coefficient of variation were very high. It resulted that even the real disclosure was applied the model was still weak in explaining. However, the signs of coefficient of variables were close to the predicted signs.

In conclusion, it was evident that the results of this study were weak to confirm the model explaining the relationship between environmental disclosure and firms' characteristics. Industry group could have significant impact on disclosures. It also concluded that shareholder's influence was a prominent factor that had statistically significance in association with disclosure but the sign was different than predicted. The followings are the analysis of other variables on why they did not show significant.

First, government influence and creditor's influence did not play major role in this study. Although government agencies, which have responsibility in environmental improvement, tried to move forward, many conflicting political issues remain. The laws are still not fully implemented as compared to developed countries. Creditors do not consider environmental issues as serious problems compared to economic issues. It was also evident from the respondents that creditors were the least important group to use the environmental report. Therefore, it could be possible that environmental information are not highly required by those two parties.

Economic performance did not present significant determinant to disclosure. It showed somewhat the opposite to what the study hypothesized. The problem of earnings fluctuation and quality of reported earnings may be the issues. The Thai

economy was booming in 1989-1995 with the GDP growth rate of over than ten percent and gradually dropped to around seven percent. In 1996 and continuing to 1997, the economy worsened. Most of the companies had their sales and profits decline. The reported financial statements of the listed companies, though audited by the auditors, had an incentive to manipulate to maintain their performance levels. The grey area of accounting estimation such as allowance for doubtful debt is an example of an approach that management can utilize to adjust their profits.

Environmental performance was found to have limited association with disclosure. Although the overall performance scores were rather high, the scores in practice specifically related to environment such as set up department to have responsibility in environment or include plans to replace natural resources were rather low. Because of the indifference in environmental performance, it may be observed that firms do not use the environmental performance as a strategy to differentiate themselves from others. They therefore may not see that disclosure of environmental information would be of benefit to the firms.



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