SEGMENT REPORTING IN PRACTICE AND QUALITY OF SEGMENT INFORMATION OF LISTED COMPANIES IN THAILAND

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The Joint Doctoral Program in Business Administration

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ABSTRACT

Title of Dissertation	Segment Reporting in Practice and Quality of Segment Information of Listed Companies in Thailand
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In Thailand, segment reporting practices have been a controversial issue over the past ten years. In fact, the origin of segmental disclosure is derived from Thai Accounting Standard (TAS) No.24, issued by the Institute of Certified Accountants and Auditors of Thailand (ICAAT). This standard became effective for fiscal years beginning on or after January 1, 1994 and is based on IAS No.14 with no substantial difference. In 1997, when Thailand experienced the economic crisis, ICAAT reformed many accounting standards including TAS No.24 and issued TAS No.50, Segment Reporting, to replace TAS No.24 in the year 2000. TAS No.50 is also based on IAS No.14 (revised 1997) with no significant difference. However, it appears that TAS No.50 was delayed in being formally pronounced as one of accounting standard.

The purpose of this study is to examine the segment reporting practices of Thai listed companies, as well as the consistency and the usefulness of segment information. In terms of segment reporting practices, this study examines the extent of compliance under the existing segment reporting standard by using data collected during the period from 1992 to 2005 and analyzing this data based on (a) how listed companies identify their segments (i.e. business segments or geographical segments), and (b) what types of accounting information is provided in segment reporting.

The empirical findings of this study reveal that before TAS No.24 became effective (1992-1993), an insignificant number of listed companies voluntarily reported segment data in the notes of their financial statements. When TAS No.24

became effective in 1994, however, the proportion of firms disclosing segment information as a topic in the notes of their financial statements grew substantially. Since the year 1998 until now, the number of firms which reported information by multi-segments in the notes of their financial statements is greater than that of firms which report information by single segment (including firms not reporting any segments in the notes of their financial statements). More companies also decided to disclose their operating segmental information by industry lines rather than by geographical areas as their operating segments. However, a problem of compliance with the existing accounting standard still exists. Further, this study has found that although TAS No.50 has been delayed in being formally pronounced as one of accounting standard, some companies (approximately 10 percent in 2005) chose to adopt this accounting standard early.

The consistency of segment information is evaluated by comparing whether segment disclosures in the notes of financial statements are consistent with those in other parts of the annual reports, such as (a) introductory annual report materials and (b) the management discussion and analysis with the sample in 2005. The results show that a problem of identifying separate classes of companies' activities exists.

With respect to the usefulness of segment information, this study examines the value relevance of segment information and also considers the association between segment information and the companies' future performance by using the sample data collected during 1994-2005. The results reveal that the market uses the segment earnings in valuing securities and that the disclosures increase the explanatory power of the model. The empirical evidence also indicates that segment earnings and segment sales are associated with a company's future performance, but is weakly correlated in supported that future performance is associated more with segment information than with aggregate information. The latter result is probably due to the absence of external data.

The findings of this study might be of use to regulators and policy-makers in Thailand. This study can also be of benefit to investors who are interested in investing their money in the Thai capital market. Finally, this study adds to the current empirical literature on the market-based accounting research and extends the implication to Thailand and the emerging market.

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INTRODUCTION

1.1 Motivation and Objectives of the Research

The segment reporting standard was officially promulgated in Thailand in 1994 when the Institute of Certified Accountants and Auditors of Thailand (ICAAT)[1] issued Thai Accounting Standard (TAS) No.24, Reporting Financial Information by Segment, which became effective for fiscal years beginning on or after January 1st, 1994. This standard is based on International Accounting Standard (IAS) No.14 with no substantial difference. This standard deals with the reporting of financial information by the segments of an enterprise, specifically, the different industries and the different geographical areas in which it operates. For each reported industry[2] and geographical segment, segmental disclosure is comprised of disclosing three main accounting transactions: (a) segment sales/revenues, (b) segment results, and (c) segment assets. The benefits of presenting information by segments are to provide users of financial statements with information on the relative size, profit contribution, and growth trend of the different industries and different geographical areas in which a diversified enterprise operates to enable the users to make more informed judgments about the enterprise as a whole. However, several arguments against segment disclosures have been discussed, e.g. the cost of compiling, processing and disseminating such information exceeds the benefits. Also, in some circumstances disclosure of information could be damaging to an enterprise. As a general rule, the more specific or future oriented a disclosure is, the greater the potential competitive disadvantage for the disclosing corporation it will be. Therefore, some consider it

[1] The ICAAT has been reorganized and renamed the Federation of Accounting Professions (FAP).

[2] This study employs the word of industry segments, business segments, and line-of-business changeable.

appropriate it to allow the withholding of certain segment information where disclosures are deemed to be detrimental to the enterprise. In particular, TAS No.24 is set to management exercise judgment in determining how the enterprise activities are to be grouped for reporting as segments.

Later, when Thailand experienced economic crisis of 1997, ICAAT reformed many accounting standards, including TAS No.24, and issued TAS No.50, Segment Reporting, to substitute TAS No.24 in the year 2000. TAS No.50 is also fully modeled on IAS No.14 revised (IAS No.14R) and is effective for fiscal years beginning on or after January 1st, 2002. Indeed, this standard can be adopted early by firms before the effective date. If a firm applies this standard before the effective date, such a firm must comply fully with the requirements of TAS No.50. Its overall tone may be one of indecision regarding the need for any mandated TAS No.50 as one of accounting standards in the period 2000. More importantly, at present, it appears that TAS No.50 is not officially recognized as one or the accepted accounting standard[3], so some listed companies still prepare their segmental information based on TAS No.24.

On the other hand, some listed companies are likely to prepare segment reporting based on TAS No.50, because these listed companies do not incur additional costs of processing the data, the reason being that TAS No.50 is applied by using the financial analysis notion of assessing enterprise risks and rewards approach for classification of business and geographic segments. The basis for identifying the predominant source and nature of risks and differing rates of return is also integrated into an enterprise's internal organizational and management structure and its system of internal financial reporting. Information about those segments may already be generated for management's use, so the incremental cost of providing information could be relatively low. TAS No.50 thus seems to be an option for Thai listed companies to disclose segment information.

For the above reasons, this study investigates how listed companies disclose segmental information in practice and whether the usefulness of such information, in the perspective of segment data, provides incremental information beyond that

[3] Under the Accountancy Act B.E. 2543, TAS must be approved by the Ministry of Commerce in Thailand (MOC) and placed into law before companies are required to adopt each standard.

contained in the firm level data and whether or not it is more reflective of future performance than of aggregated information. This study is intended to provide decision markers with an understanding of the Thai capital market and the impact of accounting information on this market. The finding in this study might be useful for regulators and policy-makers in Thailand to use in developing disclosure of segmental information policy and practices.

1.2 Research Questions

Based on the motivation and the objectives of the research, as mentioned above, this study initially investigates the segment reporting practices of Thai listed companies. Under TAS No.24, public enterprises are required to report about significant industry segments and geographic segments in which they operate. Industry and geographical segments may be determined in many ways for reporting purposes, but TAS No.24 indicates that it is the responsibility of management to exercise its judgment in determining how the enterprise activities are to be grouped for reporting as a segment. Moreover, disclosing information about segments may weaken an enterprise's competitive position because more detailed information is made available to competitors, customers, suppliers, and others. Therefore, management is likely to withhold certain segment information or to utilize broad, vague segment groupings. This study examines segment reporting practices from the year 1992 to the year 2005. The period of study includes the year when listed companies had an option to apply accounting standards between TAS No.24 and TAS No.50 with their segment reporting. The research question is set as follows.

Q1: How do listed companies disclose their segmental information?

The first research question aims to examine segment disclosure practices and the extent of compliance with the existing segment reporting standard by considering: (a) how the listed companies identify their segments (i.e. business segments, geographical segments, or both dimensions), and (b) what types of accounting information is provided in segment reporting. In addition to exploring how listed companies disclose segmental information, this study considers whether there is consistency between segment disclosures in the notes of financial statements and

those in other parts of the annual reports. The focus on consistency seems to be feasible and aim in studying segment reports, because Emmanuel and Garrod (1987: 236-238) reveal that although users prefer more detailed break-downs of the business and geographic segments with more financial data, a general concern exists that appears to relate to the consistency of the segmental disclosures with other data provided in the annual accounts and reports. According to a study by Emmanuel and Gray (1977: 38-39), the significant aspects of a company's organization in regard to its effective product/market environment are often apparent from other parts of the company report which allow investors to understand the nature of business and assess their operations. Thus, the inconsistency between segmental disclosures and supplementary disclosures about activities must confuse and may well mislead users. The question is whether or not segmental disclosures in the notes of financial statements are consistent with how companies see their reporting in other parts of annual reports such as (a) introductory annual report materials and (b) the management discussion and analysis in the year 2005. This leads to the following research question.

Q2: Are segmental disclosures of listed companies in the notes of financial statements consistent with those in other parts of the annual reports in 2005?

Besides examining segmental disclosures in practice, this study assesses the usefulness of segment information, because there is some basis for questioning the reliability and the usefulness of segmental information, in particular, the inconsistencies across firms in defining segments. When firms define their reporting segments too broadly, it results in segment revenue and profit figures that are not sufficiently homogeneous enough to be meaningful as well as causes differences in intersegment transfer pricing policies, and many arbitrary cost allocations. Most of all, segmental information gathering and dissemination are not costless. Preparers of financial statements, standards setters, and regulators would thereby be interested in knowing whether such segmental information is useful to users and whether there are benefits for the reporting firms. Although many studies are done on the issue of segment reporting by non-Thai companies in foreign countries, like the United Stated (U.S.), there is no empirical evidence that supports the usefulness of segment information in Thailand. The differences in capital markets – accounting standards,

disclosure practices, and corporate governance lead to a significant difference in the usefulness of accounting earnings (Alford, Jones, Leftwich and Zmijewski, 1993: 183). In the same perspective, such differences in capital markets and the difference in characteristics of investors may lead to a significant difference in the usefulness of segment reporting.

Furthermore, many literatures done on businesses in Thailand (e.g. Suchitra Vacharajittipan, 1991: 1-144; Pimpana Srisawadi, 1996: 1-270) find that the earnings data are informative information. However, the aggregated financial information may not be enough for investors to use in assessing the business entities' future performance, if firms have diversified their businesses into different business sectors or different geographical areas. The segmental information classified either by business sectors or by geographical areas is important in helping them to deeply evaluate how the businesses have performed, given that different industries or countries have developed their own levels of profit potential, degrees and types of risk, growth opportunities, different rates of returns on investment as well as capital needs. When firms began disclosing their segmental information in 1994, investors gained access to segmental information which allowed them to consider, more closely, the risk and growth potential of each segment.

This study is intended to test whether segment data provide incremental information beyond that contained in the firm-level data. The third research question is as follows:

Q3: Does segment data provide incremental information beyond that contained in the firm level data?

Moreover, information generally has the quality of relevance when it influences the decisions of users by helping them to evaluate future events. Imhoff (1992: 109) indicates that because analysts rely on reported earnings in preparing forecasts, accounting quality is expected to be related to the predictability and accuracy of earnings forecasts. More importantly, the main purpose of segment reporting is to allow financial statement users to analyze and understand the business entity's performance in the past as well as its future prospects. Prior studies done in foreign countries (i.e. Kinney, 1971: 127-136; Collins, 1976: 163-177) have also provided evidence to suggest that disclosure of segmental data does enhance one's ability to

predict the future earnings of multi-segment firms. In this way, if segment information can enhance understanding and improve prediction of the future value of the information series, the future performance should be more strongly associated with segment data than with consolidated data. This leads to the following research question:

Q4: Is future performance more strongly associated with segment reporting information than with aggregated information?

Overall, the motivation and objectives of this study can be summarized utilizing the framework shown in Figure 1.1.

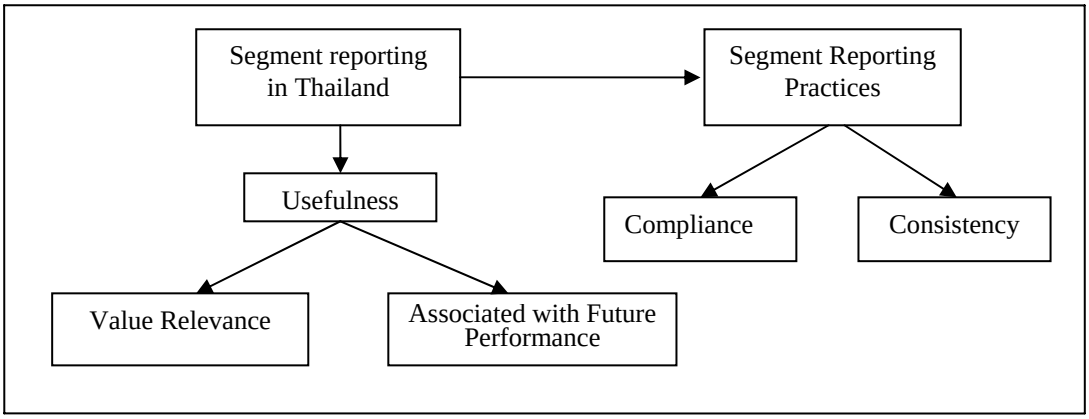

Figure 1.1 Framework of the Study

1.3 Contributions

The contributions of this study is to provide information about Thai segment reporting to various main parties interested in the Thai capital market and/or in the emerging market as follows.

Firstly, the findings of this study might be useful for regulators and policy-makers in Thailand to use in developing the disclosures of information, in particular, the implication for segmental disclosure policy, as the main purpose of the financial disclosures required by the accounting standard-setting bodies is to provide information that is intended to be useful to various economic agents such as investors

and creditors. In fact, the phenomena of using segment reporting in Thailand may be unlike that in any other foreign country, being that Thailand has promulgated TAS No.50, Segment Reporting, as a substitute for TAS No.24, albeit TAS No.24 has not been cancelled. This observable fact will not be denied being that both accounting standards are seen as an optional standard by listed companies, specifically from the period 2000 until now.

Certainly, the findings of the first and second questions concerning how listed companies disclose segmental information and whether such segmental disclosures in the notes of financial statements are consistent with other parts in annual reports are quite important for the development of the disclosures of information, because they represent the segmental disclosures in practice. Specifically, TAS No.24 permits management to exercise the judgment in determining how the enterprise activities are to be grouped for reporting as segments. The result of such a process could well differ between companies and may cause no disclosure at all.

This study investigates not only the actual segment disclosures in financial statements but also other parts of the annual reports of companies regarding the business and international activities of the companies. Another issue is the usefulness of segment information from the perspective that segment data provides incremental information beyond that contained in the firm level data and that future performance is more associated with segment reporting information than with aggregated information, because there is no empirical evidence supporting the usefulness of segment reporting disclosures in Thailand. Of course, the gathering and dissemination of segment information is not without costs. Standards setters and regulators would thereby be interested in knowing whether such segmental information is useful to users and whether there are benefits for reporting firms. This study provides information that can enhance their understanding of the Thai capital market and the impact that accounting information has on this market.

Secondly, the results of this study may have implications for investors and shareholders. In fact, investors need this information to make investment decisions such as whether they should buy, hold, or sell. Investors and shareholders are also interested in this information and use it assess the ability of the enterprise to pay dividends. Hence, information regarding the extent of operations in different segments

can enable investors and shareholders to understand the impact that accounting information has on their appraisal of investment opportunities.

Thirdly, the findings of this study may enable listed companies to understand whether the accounting information provide by them has any implication in the Thai capital market. Indeed, the gathering and dissemination of segment reporting have monetary costs and management may face increased competitive risk as a result of competitors knowing more about the company. In contrast, if preparers find that segment information is useful to investors and that the segment disclosures are cost effective, companies may wish to improve or increase segment disclosures. A possible reason is that such disclosures can allow a firm to develop its creditability and public image, and this will have a positive effect on share prices.

Finally, for researchers who are interested in the implication of accounting research in Thailand and in the emerging market, this study contributes to the body of knowledge by extending disclosure benefits studies to Thailand, because disclosure benefit studies on segment reporting until now have been mainly conducted only on firms in industrialized countries of North America and Western Europe. In fact, the relationship between theory and empirical research differs from situation to situation, because of the different environmental phenomena. Thailand has a different environmental structure, e.g. capital market, which leads to a significant of the usefulness of financial reporting, including that of segment reporting. This study will add to the current empirical literature in the area of market-based accounting research and will extend the implication to the emerging market.

1.4 Structure of the Study

Chapter Two presents the theoretical framework and segment reporting practices of firms in Thailand. Chapter Three contains literature review. Chapter Four discusses hypotheses development and provides the details about the data sources, sample selection and research methodology. Chapter Five presents empirical results on segment reporting practices in Thailand, while Chapter Six discusses empirical evidence on the usefulness of segment disclosures. Chapter Seven then presents the conclusions and implications of present research.

CHAPTER 2

THEORETICAL FRAMEWORK AND SEGMENT REPORTING OF FIRMS IN THAILAND

This study focuses on segment reporting in practice and the quality of segment disclosures. In general, when the purpose of financial reporting is to provide information that is useful for decision making, the quality of segment reporting is defined as segment information that influences the economic decisions of users or is useful. In this context, segment data should provide incremental information beyond that contained in the firm level data, and future performance should be more associated with segment reporting information than with aggregated information. There are two important aspects that will thus be discussed in this chapter: (a) segment reporting practices, and (b) decision usefulness.

Section 2.1 describes segment reporting requirements of firms in Thailand. The usefulness of this information in the decision making process is discussed in Section 2.2.

Details regarding each issue are discussed in the following.

2.1 Segment Reporting Practices

Before discussing segment reporting, this study will elaborate on the general framework of disclosure to provide a better understanding of the role of disclosure in Section 2.1.1 and then discuss the segment disclosure requirements of firms in Thailand in Section 2.1.2.

2.1.1 The General Framework of Disclosure

In general, disclosure is the announcement or publication of any economic information relating to a business enterprise that facilitates investment decisions.

Firms provide disclosure through regulated financial reports, including the financial statements, footnotes of the financial statements, supplementary statements and schedules, management discussion and analysis, and etc.

The motivation to disclose information stems from the problems of information asymmetry and absence of incentives. One potential solution to the information asymmetry problem is regulation. This leads directly to the role of setting standards which lay down generally accepted accounting principles (GAAP) that requires managers to fully disclose their private information. Full disclosure is the supplying of large amounts of information to help investors make their own predictions of a firm's future performance. Therefore, disclosure is a critical means used by management to communicate information on firm performance and corporate governance to outside investors.

To provide a better understanding of the role of disclosure, this section introduces the concept of how financial and related information flows in a capital market economy based on Healy and Palepu (2001: 408), as indicated in Figure 2.1.

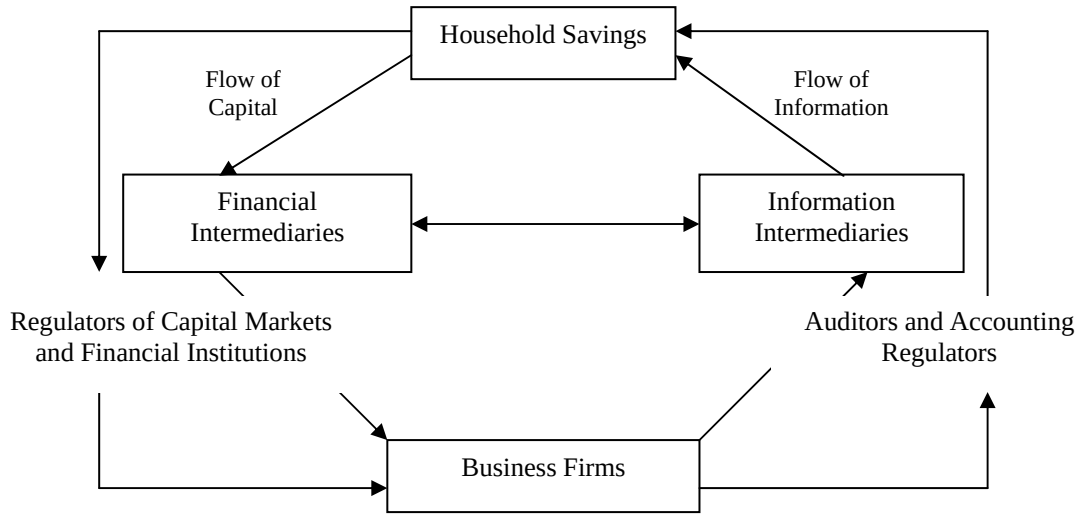

Figure 2.1 Financial and Information Flows in a Capital Market Economy
Source: Healy and Palepu, 2001: 408.

A considerable challenge for any economy is the optimal allocation of saving versus pursuing investment opportunities. Figure 2.1 shows that capital can flow

directly to business, or flow through financial intermediaries (i.e. banks, venture capital funds, and insurance companies). In the same way, firms can communicate directly with investors through such media as financial reports and press releases, or through information intermediaries, such as financial analysts.

Many new entrepreneurs and existing companies would like to attract household savings to fund their business ideas, according to Healy and Palepu (2001: 407). While both savers and entrepreneurs would like to do business with each other, matching saving to business investment opportunities is complicated for at least two reasons. Firstly, entrepreneurs generally have better information than savers have about the value of business investment opportunities and also have incentives to overstate their value. Secondly, once savers have invested in their business ventures, entrepreneurs have an incentive to expropriate their savings, creating an agency problem.

Entrepreneurs who have better information than savers have causes an agency problem, Scott (1997: 3-4) mentions that such a matter as information asymmetry results when some parties to business transactions have an information advantage over other parties.

Information asymmetry can be classified as an adverse selection and a moral hazard. From the perspective of adverse selection, information asymmetry arises because one party has knowledge not possessed by the other. All parties may benefit from a reduction of information asymmetry. For example, entrepreneurs going public may receive a higher share price if his or her true quality can be credibly revealed to skeptical investors. Financial reporting is a mechanism used to control the adverse selection problem by credibly converting inside information into outside information.

In contrast to the perspective of moral hazard, information asymmetry arises because parties cannot observe the actions of others when those actions affect the interests of all parties to the transaction. It occurs because of the separation of ownership and control that characterizes most large business entities. Healy and Palepu (2001: 409) explain that the agency problem arises because savers that invest in a business venture generally do not intend to play a role in its management. Shareholders and creditors cannot observe the extent and quality of management's effort on their behalf. Therefore, the accounting income of financial reporting – a

measure of managerial performance – helps to control the moral hazard problem. That is, it serves as an input into executive compensation contracts that motivates managers to perform. It also informs the securities and managerial labor markets that a manager who shirks will cause a decline in s firm's income, reputation, and market value over time.

Moreover, market forces can sufficiently control the adverse selection and moral hazard problems so that investors are protected and the managerial labor markets and securities markets work reasonably well (Scotts, 1997: 5-6). The market forces consist of two sides: (a) demand side, and (b) supply side. Investors and other financial statement users are demanders of information, while mangers are suppliers of information. It is likely that there is an incentive to respond to the information demands of users, since companies compete for finance from investors. The disclosure of information to investors is a primary means by which a firm maintains its credibility and enhances its market value.

In the case of market forces alone fails to control adequately those problems, regulation is a means of protecting investors. This leads directly to the role of standard setting which involves the GAAP. By creating minimum disclosure requirements, regulators reduce the information gap between informed and uninformed. Accounting standards regulate the reporting choice available to managers to use in presenting the firm's financial data to the public.

One GAAP practice explored in this study is the accounting standard about segment reporting. The next section will explain the segment disclosure requirements of firms in Thailand.

2.1.2 Segment Disclosure Requirements in Thailand

This section discusses two accounting standards. The first one is TAS No.24 discussed in Section 2.1.2.1 and the other is TAS No.50 described in Section 2.1.2.2.

2.1.2.1 Thai Accounting Standard No.24

TAS No.24 became effective for fiscal years beginning on or after January 1st, 1994. The objective of breaking down financial information by segments is to provide users of financial statements with information on the relative size, profit contribution, and growth trend of the different industries and different geographical

areas in which a diversified enterprise operates to enable users to make more informed judgments about the enterprise as a whole. Details regarding TAS No.24, Reporting Financial Information by Segment, are summarized in Figure 2.2. In addition to the enterprises in which TAS No.24 is applied, Figure 2.2 represents a diagrammatic view of the presentation of data in financial statements, the disclosure for each segment, and transitional provision.

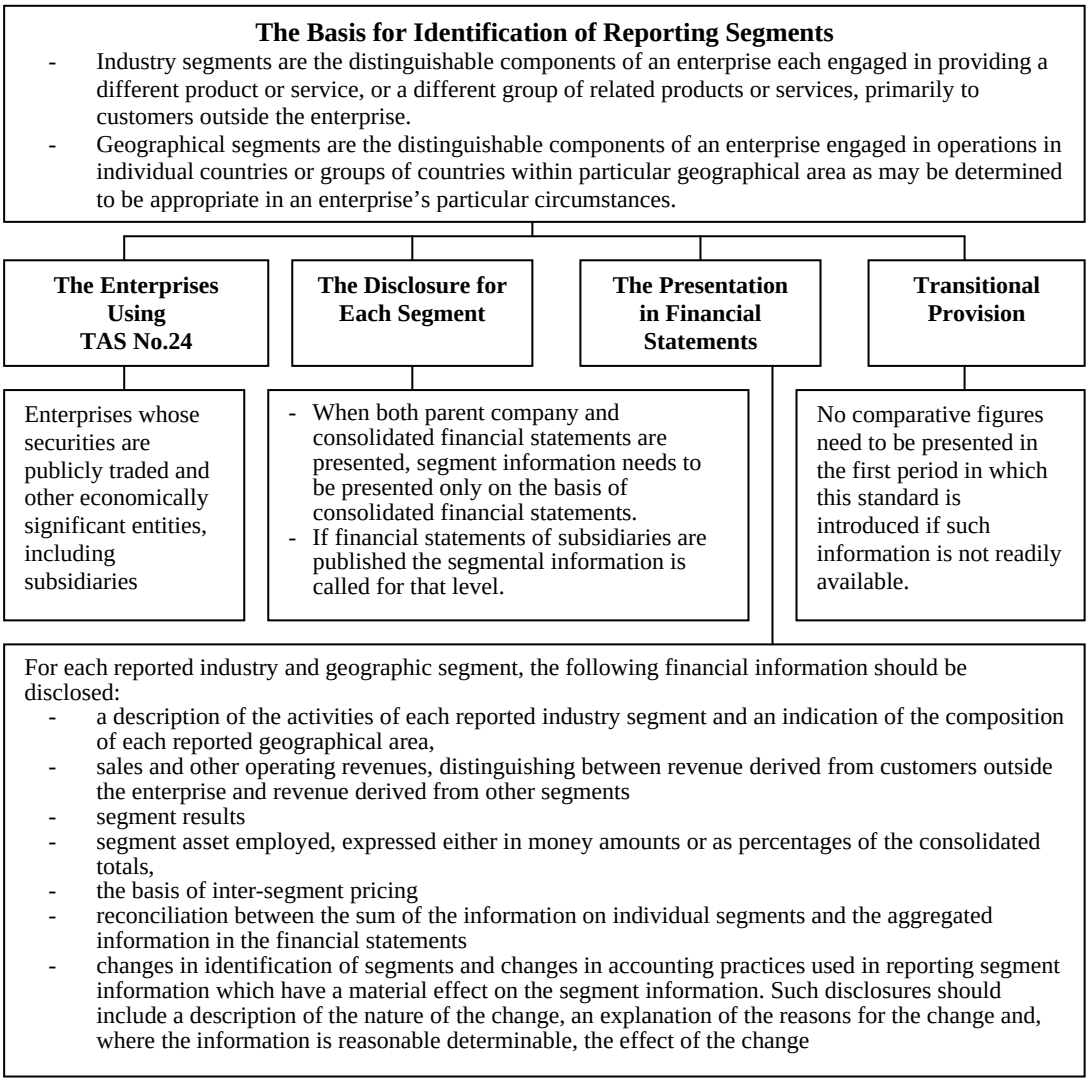

Figure 2.2 Summary of TAS No.24, Reporting Financial Information by Segments

Source: Adapted from Ministry of Commerce, 1999: 15.

This standard sets a simple guideline on how material a segment should be before it is reported separately as well as sets a limit on the amount of segments to a reasonable number so as to avoid unnecessary complexity. Such guidelines may be 10 percent of consolidated revenue, or operating profit or total assets, although such a quantitative guideline is not the only factor that determines how the data is reported. The other factors identified in Paragraph 11 of TAS No.24 may include similarities and differences in the enterprise's products and activities; in the profitability, risk and growth of those products and activities; and in the operating and marketing areas and the relative importance of those areas within the enterprise as a whole. The existence of special regulatory requirements and specific industry characteristics such as in the banking and insurance industries may constitute additional factors to be considered in determining segments to be reported. Together, industry and geographical segments may be determined in many ways for reporting purposes. It is the responsibility of management to exercise its judgment in determining how the enterprise activities are to be grouped for reporting as segments.

As a matter of fact, TAS No.24 is fully modeled on IAS No.14 which was approved by the International Accounting Standard Committee (IASC)[4] in 1981. However, IAS No.14 is similar to the Statement of Financial Accounting Standards (SFAS) No.14, Financial Reporting for Segments of a Business Enterprise (Haller, 2003: 448). SFAS No.14 was developed in 1976 as the first comprehensive national standard which required companies to disclose their segment revenue, segment income, segment assets, depreciation, and capital expenditures. Therefore, TAS No.24 is not different from IAS No.14 and takes a similar approach to SFAS No.14, as summarized in Table 2.1 which shows the major differences of segmental disclosure requirements among TAS No.24, IAS No.14, and SFAS No.14.

[4] The International Accounting Standard Committee (IASC) now renamed as the International Accounting standards Board (IASB) following a restructuring of the governance of the IASC in 2001.

Table 2.1 The Major Difference of Segmental Disclosure Requirements among TAS No.24, SFAS No.14, and IAS No.14

Disclosure Requirements	TAS No.24	IAS No.14	SFAS No.14
Lines of Business			
- Sales revenues	x	x	x
- Operating profits	x	x	x
- Assets	x	x	x
- Capital expenditure			x
- Depreciation			x
Geographical Areas			
- Sales revenues	x	x	x
- Operating profits	x	x	x
- Assets	x	x	x
- Depreciation			x
Others			
-Transfer pricing policy	x	x	x
-Major customers			x

Source: Adapted from Prodham, 1986: 48**.**

Later, ICAAT issued TAS No.50, Segment Reporting, as a substitute for TAS No.24. This substitution resulted from the economic crisis of 1997, accounting standards and financial statements were blamed as one of the problems relating to the crisis in 1997 (Rahman, 1998: 6). Following the economic crisis, Thailand had to borrow money from the International Monetary Fund (IMF). One condition for loans was that the Thai government improves its financial accountability and corporate governance (Sillapaporn Srijunpetch, 2004: 70). The ICAAT reformed accounting standards by establishing a new set of accounting standards which adopt internationally accepted accounting practices to the maximum extent possible. Consequently, a number of new accounting standards, including TAS No.50, were issued during the year 1999-2000. The next section discusses the nature of TAS No.50.

2.1.2.2 Thai Accounting Standard No.50

TAS No.50 was issued in 2000, but was originally intended to be applied for fiscal years beginning on or after January 1st, 2002. Indeed, this standard indicates that firms could have adopted the standard before the effective date. TAS No.50 is

based on IAS No.14R with no substantial difference. IAS No.14R was revised in 1997 and became effective for fiscal year beginning on or after July 1, 1998. Albrecht and Chipalkatti (1998: 50) revealed that the old accounting standard (IAS No.14) was criticized for permitting too many alternative interpretations in an attempt to accommodate its diverse constituencies. It was also criticized for not providing sufficiently detailed definitions of and guidance for key items. More importantly, it did not requiring the disclosure of additional financial and descriptive data about segments. In contrast, the new accounting standard (IAS No.14R) provides explicit quantitative thresholds for the reporting of segments, has clear definitions of all disclosures, and provides clear guidelines that an enterprise may apply to its segment reporting. Just as TAS No.24 and 50 are based on IAS No.14 and 14R, so the above arguments can be implied to segment accounting standards of Thai that TAS No.50 should be better than TAS No.24.

The objective of TAS No.50 is to establish principles for reporting financial information by requiring the disclosure of segment-information to help users of financial statements as follows: (a) better understand the enterprise's past performance; (b) better assess the enterprise's risks and returns; and (c) make more informed judgments about the enterprise as a whole. For the identification of primary segments, TAS No.50 employs the management approach.[5] That is, an enterprise will report segment information in its financial statement on the same basis as it reports internally to top management.

Following IAS No.14R, although the ICAAT utilizes the management approach to identify segments, the classification of business and geographic segments is based on the risk and reward characteristic. For example, TAS No.50, paragraph 9, defines the terms of business segment as a distinguishable component of an enterprise that is engaged in providing an individual product or service or a group of related products or services and that is subject to risks and returns that are different from those of its other business segments, while geographical segment is a distinguishable

[5] Like IAS No.14R, TAS No.50, Paragraph 27, states that "an enterprise's internal organizational and management structure and its system of internal financial reporting to the board of directors and the chief executive officer should normally be the basis for identifying the predominant source and nature risks and differing rates of return facing the enterprises and, therefore, for determining which reporting format is primary and which is secondary…"

component of an enterprise that is engaged in proving an individual product or services within a particular economic environment and that is subject to risks and returns that are different from those components operating in other economic environments.

Hence, some people may describe this approach as the “risks and returns approach” or “a management approach with a risks-and-rewards safety net”. In addition to the identification of segments, the risk-rewards approach is applied to determine the nature of primary and secondary reporting requirements. Indeed, TAS No.50 adopts a two-tier approach and requires information to be disclosed both by line-of-business/business segments and geographical segments. If the primary tier is based on business (geographic) segments, the second tier is based on geographic (business) segments. For determining the reporting format (i.e. the primary and secondary segments), TAS No.50 obtains the predominant sources and nature of risks and differing rates of return facing the entity from the enterprise’s organizational and management structure and its internal financial reporting system. If the enterprise’s risks and rates of return are affected predominantly by the differences in the products and services it produces, its primary format for reporting should be by business segments, with secondary information reported geographically. On the contrary, if the enterprise’s risks and rates of return are affected predominantly by the fact that it operates in different countries or in other geographical areas, its primary format for reporting should be by geographical segments, with secondary information reported for business segments/ groups of related products and services. In the case when an enterprise’s risks and rates of return are strongly affected both by differences in the products and services it produces and by differences in the geographical areas in which it operates, then the enterprise should use business segments as its primary segment reporting format and geographical segments as its secondary reporting format. If an enterprise’s internal organizational and management structure and its system of internal financial reporting are based neither on individual products/services nor on geography, TAS No.50 requires that the enterprise choose between business segments and geographical segments for its primary and secondary tiers. In this case, the enterprise employs the following decision tree of segment definition as indicated in Figure 2.3 in order to determine its business segments and geographical segments.

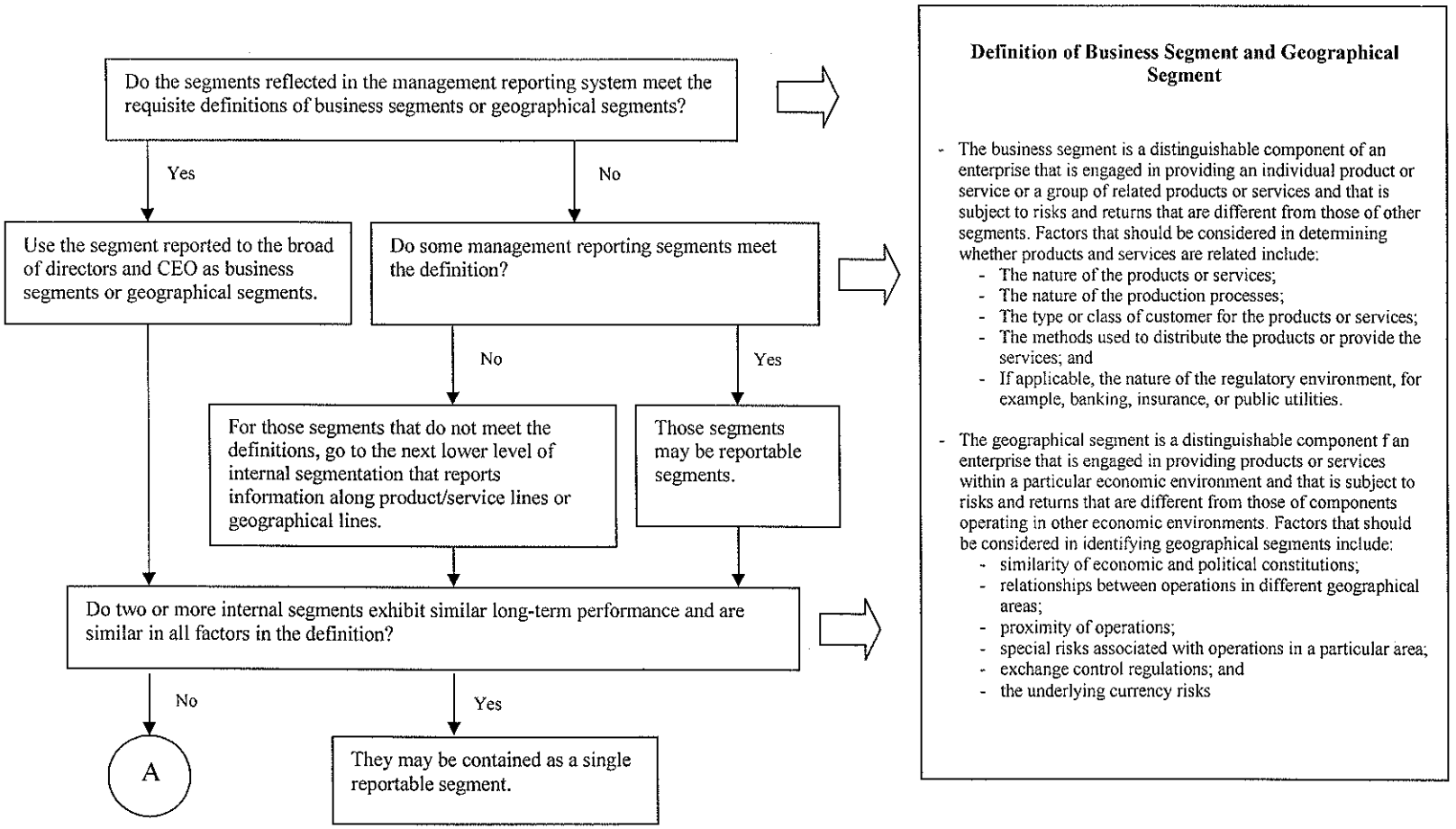

Figure 2.3 Segment Definition Decision Tree Based on TAS No.50

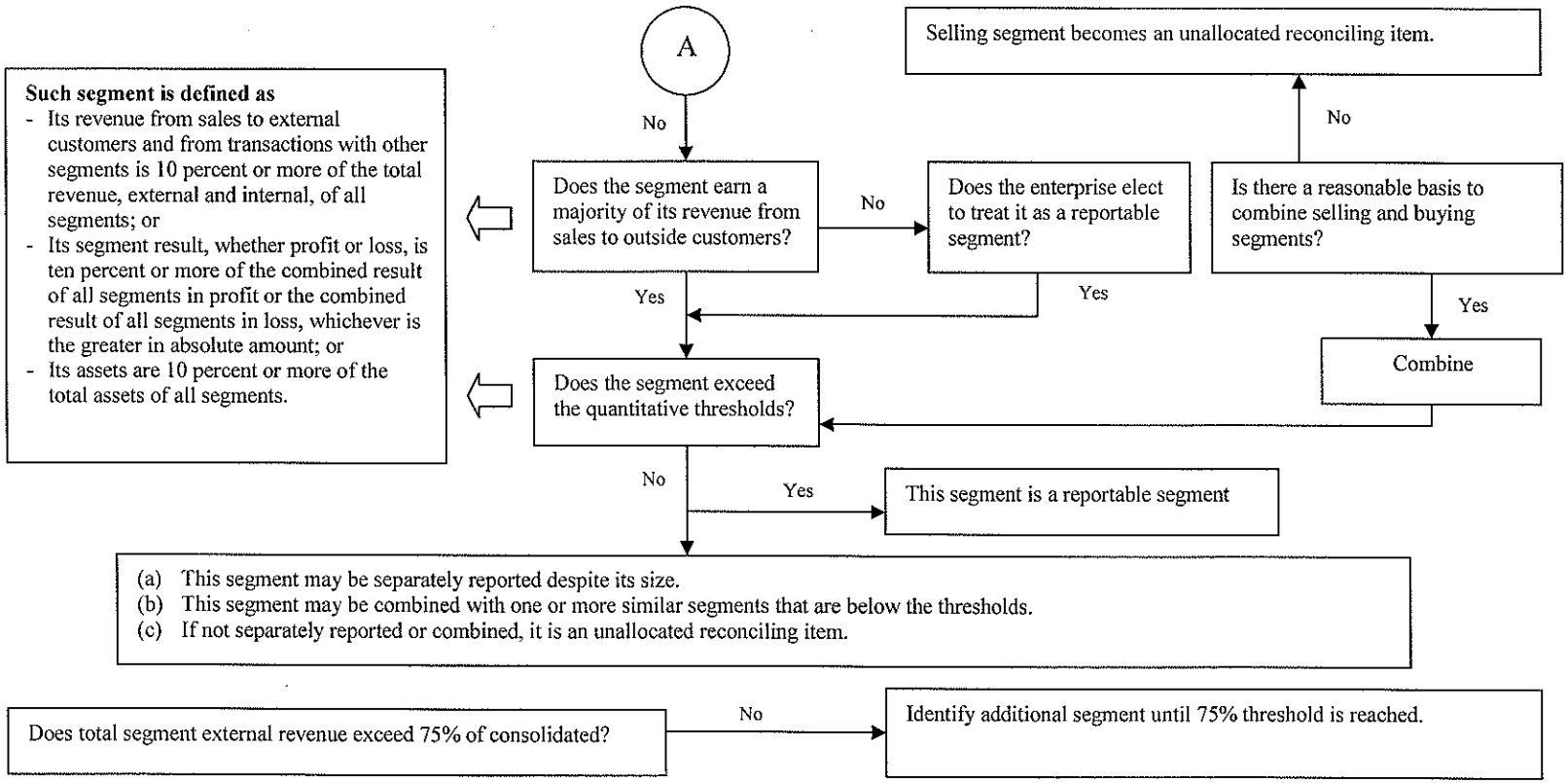

Figure 2.3 (Continued)

Sources: Adapted from IASC, 2003: 328 and ICAAT, 2000: 32.

Because TAS No.50 adopts a two-tier approach and requires information both by line-of-business/business segments and by geographical segments, this study firstly summarizes the disclosures required for reportable segments for an enterprise's primary segment reporting format in Table 2.2.

Table 2.2 Summary of Required Disclosure for an Enterprise's Primary Segment Reporting Format

List of segment information to be disclosed:
(a) Revenue from external customers
(b) Revenue from transactions with other segments
(c) Segment Results
(d) Carrying amount of segment assets
(e) Segment liabilities
(f) Cost of acquire property, plant, and equipment, and intangibles
(g) Depreciation and amortization expense
(h) Non-cash expenses other than depreciation and amortization
(i) Share of net profit or loss of and investment in equity method associates or joint ventures (if substantially all within a single business segment)
(j) Reconciliation of revenue, result, assets, and liabilities

Sources: IASC, 2003: 319-322 and ICAAT, 2000: 22-25.

For an enterprise's secondary reporting format, the disclosure required is summarized in Figure 2.4

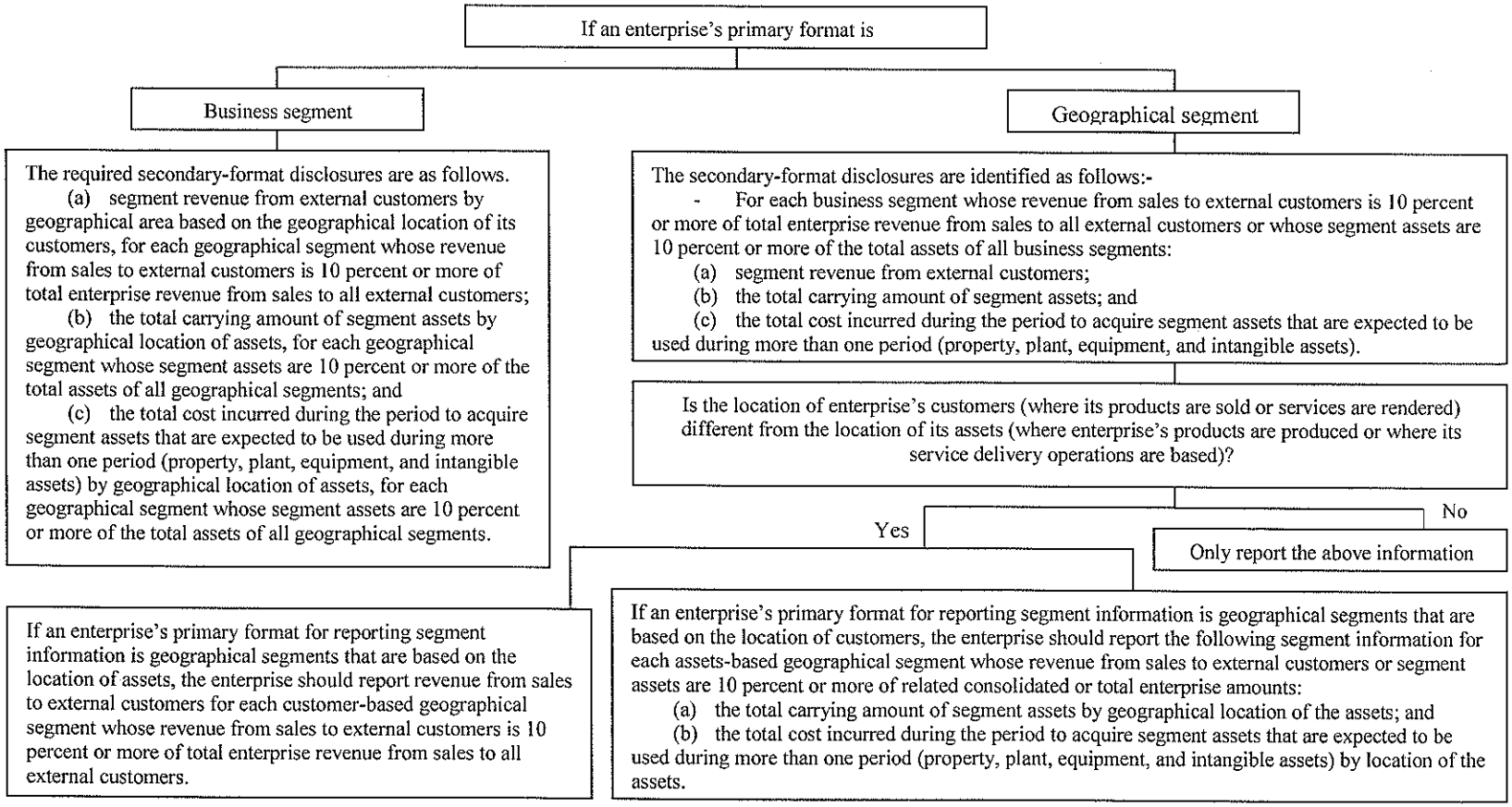

Figure 2.4 Summary of Required Disclosure for an Enterprise's Secondary Segment Reporting Format

Sources: IASC, 2003: 322-324 and ICAAT, 2000: 25-27.

In addition to the disclosure of primary and secondary reporting formats, several other segment disclosure matters are required by TAS No.50. Table 2.3 summarizes the other required disclosures.

Table 2.3 Summary of Other Required Disclosures in TAS No.50

Items	Primary Format is		
		Geographical Segments by	
	Business Segments	Location of Assets	Location of Customers
- Revenue for any business or geographical segment whose external revenue is more than 10 percent of enterprise revenue but that is not a reportable segment because a majority of its revenue is from internal transfers.	x	x	x
- Basis of pricing intersegment transfers and any change therein	x	x	x
- Changes in segment accounting policies	x	x	x
-Types of products and services in each business segment	x	x	x
- Composition of each geographical segment	x	x	x

Sources: IASC, 2003: 324-326 and ICAAT, 2000: 27-29.

Overall, TAS No.50 significantly expanded the items of information to be disclosed over TAS No.24. Although TAS No.50 has not been formally effective, the firms could have chosen to apply TAS No.50 starting in year 2000. If a firm did so, such a firm must have complied fully with the requirements of TAS No.50. That is, firms must disclosed revenues (external and inter-segment), earnings, assets, basis of inter-segment pricing, liabilities, capital expenditures, depreciation, non-cash expenses other than depreciation, equity method income, and a reconciliation to consolidated accounts for the primary segments. For the secondary segments, TAS No.50 requires the disclosure of revenues, assets, and capital expenditures. Moreover, TAS No.50 encourages the disclosure of segment cash flow information. The standard also allows an enterprise to use the matrix presentation – both business segments and geographical segments as primary segment reporting formats with full segment

disclosures on each basis, which provide useful information if its risks and rates of return are strongly affected both by differences in the products and services it produces and by differences in the geographical areas in which it operates.

As stated earlier, TAS No.50 is fully modeled on IAS 14R. McConnell and Pacter (1995: 49-51) suggested that the revision of IAS 14R should modify practice. For example, companies would no longer be able to escape segment reporting by arguing that they are in a single broad industry; more items of segment data will be reported; and while individual countries are not presumed to be in separately reportable geographic segments, combining countries whose risks and returns are different is inconsistent with the objective of segment reporting and the standard. Accordingly, Street and Nichols (2002: 91-113) reported that IAS 14R caused a significant increase in the number of items of information disclosed for each primary and secondary segment. The consistency of segment information with the introductory annual report material also increased significantly whereas the number of companies claiming to operate in one line-of-business declined significantly.

Note that there are many merits of the new accounting standard, but in Thailand, TAS No.50 is still delayed to formally pronounce as one of accounting standard. Hence, most listed companies have still prepared the segmental information based on TAS No.24. One possible reason is that there is no empirical evidence to support the usefulness of segment information or there is no research directly done on the impact of segment disclosure on the Thai capital market.

This study is, therefore, needed to provide some information of segment reporting practices of Thai listed companies and the usefulness of segmental information in order to enhance the understanding of the Thai capital market and the impact of segment disclosure on this market. The findings might be useful for regulators and policy-makers in Thailand to develop rules and regulation for the disclosure. Next section explores a theoretical basis for the disclosure of segmental data.

2.2 The Decision Usefulness

A number of recent studies have discussed the role that public information has in an economy, specifically, from the perspective of decision usefulness. The objective of financial statements stated by IASB and the ICAAT in the “Framework for the Preparation and Presentation of Financial Statements”, paragraph 12, state that the objective of financial statements is to provide information about the financial position, performance and changes in the financial position of an enterprise that can be used by a wide range of users in making economic decisions. The economic decisions that are made by users of financial statements requires that they be able to evaluate the ability of an enterprise to generate cash and cash equivalents and of the timing and certainty of their generation.

In the same way, if segment reporting is to have usefulness, in particular, it must provide information to help users of financial statements to analyze and understand the business entity’s performance in the past as well as its future prospects. The segment information thus enables users of financial statements to better evaluate the ability to generate cash and cash equivalents. Conceptually, segment reporting is part of the broader issue of data disaggregation and always relies on the Fineness Theorem. This Theorem shall be discussed in Section 2.2.1.

Next, under the decision context, many studies focus on the relationship between publicly disclosed accounting information and the characteristics of common stocks traded in major exchanges. This relationship is the reaction that major groups of the users of publicly disclosed accounting information, i.e. equity investors, have to this information. The market-based accounting research is also conducted according to the prevailing paradigm in financial economics, such as the efficient markets hypothesis, equity security valuation, and etc. Those theoretical frameworks that have significant implication against market based accounting research, in particular, the studies done on segment information disclosures shall be addressed in Section 2.2.2.

2.2.1 The Fineness Theorem

Prior studies (Marschak and Radner, 1972: 53-59; Ajinkya, 1980: 343-361; Mohr, 1983: 41-42; Hermann and Thomas, 1997: 490) explained that the Fineness Theorem provides a theoretical basis for the disclosure of segmental data. Defining the terminology of these studies, the information structure A is said to be as fine as or finer than information structure B if A is a subpartition of B. In other words, if every subset of A is contained in a subset of B, then the information provided in A is at least as fine as the information provided in B. The Fineness Theorem states that the information in A is preferred to the information in B as long as every signal from A is fully contained in a signal from B.

The Fineness Theorem applied to the area of segmental disclosure (e.g. geographic segmental data, or line of business segmental data) suggests that the disclosure of a disaggregated complex information signal can enhance the understanding and improve the prediction of future values of the information series. Different industries and different countries have a variety of profit potentials, degrees and types of risk, and growth opportunities. Different rates of returns on investment and different capital needs are also likely to exist through out the various segments of a business. Therefore, investors have a need for segmental information, a finer source of information, in addition to consolidated information. The fineness theorem indicates that this finer information will result in more valuable information to users.

Following Ajinkya (1980: 344) and Herrman and Thomas (1997: 490) works, it can be concluded that the predictions of earnings or stock investment decisions based on line-of-business or geographic segmental data is not worse than those based upon consolidated financial data. Mohr (1983: 41) mentions that by viewing the incremental disclosure of segmental sales, earnings, or other data as successively “finer subpartitions” of the information set, a number of “fineness” comparison are possible. More specifically, each of these comparisons may imply that the finer information system is at least as valuable to the decision maker as the reporting of consolidated data alone, consistent with the theoretical result.

However, some literature (i.e. Sihan, 1982: 256; Hermann and Thomas, 1997: 490) indicate that under certain conditions, the fineness theorem may not hold in

practice. As data become more isolated through disaggregation, there is the possibility that a random factor (e.g. measurement error) will suppress the “true” signals from being analyzed. Correspondingly, if segment data are either measured or reported with error, decisions using the finer data need not be as accurate as the decisions using consolidated data alone. Thus, ‘noise” may induce specification errors which diminish forecasting performance. That is, decisions using segment data may compound the measurement or reporting error to a greater extent than decisions based on consolidated data.

In moving from the Fineness Theorem to the decision context and the relation to the user of financial data, Mohr (1983: 42) indicated that a transition of the results of financial theory provides a linkage between the availability of segmental data and the user’s payoff-maximizing decision rule. Modern capital market theories, developed in the 1960s, provided the missing link and established a coherent program for the financial accounting research. Capital market theories have tried to link the accounting information system to its function in capital markets. Each theoretical framework, in addition to Fineness Theorem, is discussed in Section 2.2.2.

2.2.2 Other Theoretical Frameworks

Most market-based accounting research indeed determines the impact of accounting information on the capital market. In general, the role of the capital market is to provide an orderly exchanges to take place whereby investors may exchange claims to present and future consumption on a continuous basis. The information has two important roles: (a) to aid in establishing a set of equilibrium securities prices, such that there exists an optimal allocation of securities among investors, and (b) to enable individual investors, who faces a given set of prices, in the selection of an optimal portfolio of securities. The major theoretical frameworks influence the studies on segment reporting, namely the Efficiency Market Hypothesis (EMH), and equity securities valuation. Both theoretical frameworks are directly related to the research design of my study, so are discussed in Section 2.2.2.1 and Section 2.2.2.2, respectively.

2.2.2.1 The Efficiency Market Hypothesis (EMH)

The relationship between aggregate-market behavior and accounting variables is based on the theory of capital-market efficiency. In general, the primary role of capital markets is the allocation of ownership of the economy's capital stock. Fama (1970: 383) explained that the ideal market is a market in which prices provide accurate signals for resource allocation: i.e. a market in which firms can make productive-investment decisions, and investors can choose among the securities that represent ownership of firms' activities under the assumption that security prices at any time 'fully reflect' available information. A market in which prices always 'fully reflect' available information is called 'efficient'.

The EMH thus assumes that stock prices accurately reflect information, and investor cannot use this information to obtain consistently higher returns than justified by an investment's risk, because price will adjust rapidly and appropriately to new information. The theory implies that on average, the abnormal return (the return in excess of the equilibrium expected return) to be earned from employing a set of extant information in conjunction with any trading scheme is zero. Changes in information will automatically result in a new price equilibrium (Belkaoui, 2000: 282-283).

The EMH has its origins in the random walk hypothesis that basically states that at any given point in time the size and direction of the next price change is random relative to what is know about an investment at that given time. This concept has a crucial role in developing market-based accounting research, because market research is based on the use of security price as the benchmark or operational measure of usefulness for accounting data. There are three common forms of this hypothesis (Fama, 1970 Quoted in Beaver, 1998: 128) as follows: (a) the weak form EMH, (b) the semi-strong form EMH, and (c) the strong form EMH.

1) The Weak Form EMH

The market is efficient in the weak form if prices fully reflect information regarding the past sequence of prices. This form of market efficiency has obvious implications for technical analysis, and it includes the random walk theory of stock prices. The implication of this form of the EMH is that some of the information provided by security analysts is useless.

2) The Semi-Strong Form EMH

The market is efficient in the semi-strong form if prices fully reflect all publicly available information, including financial statement data. Trading strategies based on published financial statement data will not lead to abnormal returns. The implication of this form is that footnote disclosure is just as relevant as the information contained in the body of financial statements. The accounting procedures adopted by a particular organization will have no effect if an investor can convert to the desired method.

3) The Strong Form EMH

The market is efficient in the strong form if prices fully reflect all information, including inside information. Hence, even having access to privately held information will not lead to strategies promising abnormal expected returns.

The semi-strong form EMH is particularly relevant to accounting research, because financial statements contain information what is publicly. The results of EMH research suggest that stock prices are not determined solely by accounting reports, because financial statements are not the only sources of information used for making investment decisions. This leads researchers to examine the relation of how accounting information are related to stock prices. Another implication is that no trading advantages accrue to users of financial statements, because the information contained in them is instantaneously reflected in prices as soon as the information becomes public.

2.2.2.2 Equity Securities Valuation

When examining the implication of EMH, investors attempt to use accounting numbers measure firm value. Publicly available information consists of a rich set of information including not only accounting amounts, but also anything in the public domain that investors perceive as relevant to firm valuation. Barth (2000: 11) indicated that although the market is not totally efficient in processing the valuation implications of all publicly available information, share prices reflect the consensus beliefs of investors. Hence, share prices have become the most common value measured in financial reporting research. This section shall describe the valuation model directly relating to this research study, i.e. the abnormal earnings model (Ohlson's model).

The abnormal earnings model is derived from Ohlson (1995: 661-687). He used the dividend discount model as the initial model to explain the relationship between accounting information and the price of common stocks. He provided a characterization of the security valuation in which prices are explained by the firm's book values and by the firm's future abnormal earnings. This led to express firm values as the following sum over an infinite number of terms:

$$P_t = BV_t + \sum_{\tau=1}^{\alpha} \frac{Exp_t[E_{t+\tau} - rBV_{t+\tau-1}]}{(1+r)^{\tau}} \qquad \text{(Equation 2.1)}$$

where P_t : the price per share at time t;

BV_t : book value of equity per share at time t;

r : discount rate;

$Exp_t[.]$: expectations formed at the end of period t; and

$E_{t+\tau}$: earnings per share for the period $t+\tau$.

This relation requires that all gains and losses affecting book value be included in earnings; i.e. the change in book value from period to period is equal to earnings less net dividends ($BV_t = BV_{t-1} + E_t - d_t$). The clean surplus relation is an important property of financial statements from one simple accounting relation. Hence, Equation 2.1 is derived from the following assumptions:

Firstly, the assumption of the dividend valuation model suggests that price is equal to the present value of expected dividends:

$$P_t = \sum_{\tau=1}^{\tau} \frac{Exp_t(d_{t+\tau})}{(1+r)^{\tau}}$$

Secondly, the assumption of the clean surplus accounting relation indicates that

$$BV_t = BV_{t-1} + E_t - d_t$$

which can be rewritten as follows:

$$d_t = BV_{t-1} + E_t - BV_t$$

Based on these assumptions, the model allows future dividends to be expressed in terms of future earnings and book values. Combining both assumptions, it follows that:

$$P_t = \sum_{\tau=1}^{\alpha} \frac{Exp_t[BV_{t+\tau-1} + E_{t+\tau} - BV_{t+\tau}]}{(1+r)^{\tau}} \qquad \text{(Equation 2.2)}$$

Equation 2.2 can be rewritten as

$$P_t = BV_t + \sum_{\tau=1}^{\alpha} \frac{Exp_t[E_{t+\tau} - rBV_{t+\tau-1}]}{(1+r)^{\tau}} - \frac{Exp_t[BV_{t+\alpha}]}{(1+r)^{\alpha}} \qquad \text{(Equation 2.3)}$$

The final term in Equation 2.3 is assumed to be zero, and the residual income or abnormal earnings is defined as

$$E_t^a = E_t - rBV_{t-1}$$

so that price can be expressed as the sum of book values and the present value of future abnormal earnings:

$$P_t = BV_t + \sum_{\tau=1}^{\alpha} \frac{Exp_t[E_{t+\tau}^a]}{(1+r)^{\tau}} \qquad \text{(Equation 2.4)}$$

Thus, Equation 2.4 is the same as the Equation 2.1.The model holds for any set of accounting methods as long as the clean surplus condition holds. Change in future earnings or changing from one set of methods to another is offset by changes in book value. The future abnormal earnings in the model are defined as the difference

between the current income and the normal earnings on book value (the discount rate multiplied by accumulated earnings plus contributed capital). Therefore, “normal” and “abnormal” earnings represent mechanisms for comparing nominal income amounts across time. However, the variable on the right-hand side of Equation 2.4 are forecasts, not past realizations. To fineness this problem, Ohlson (1995: 661-687) introduces the idea of linear information dynamics in addition to the assumption of present value of expected dividend models and clean surplus relation. It is the stochastic process for abnormal earnings (E^a_{t+1}) and nonaccounting information (V_t). It can be written as follows:

$$E^a_{t+1} = \omega E^a_t + V_t + \varepsilon_{1t+1} \qquad \text{(Equation 2.5)}$$

$$V_{t+1} = \gamma V_t + \varepsilon_{2t+1} \qquad \text{(Equation 2.6)}$$

where ω and γ are known parameters between zero and one, and ε’s are mean zero and uncorrelated with other variables in the model . That is, the linear information dynamic suggests that both abnormal earnings and nonaccounting information are autoregressive. Nonaccounting information is an additive shock to next period’s abnormal earnings. The nonaccounting information can be completely unpredictable (γ = 0) or partially predictable (γ = 1), but it must flow through abnormal earnings in the next period. The distinction between V_t and ε_{1t+1} is that V_t is partially forecastable while ε_{1t+1} is completely nonforecastable. Besides, the nonaccounting shock to abnormal earnings in period t becomes part of the autoregressive process for E^a_{t+1} going forward. Therefore, non-accounting information generates shocks autoregressively and these shocks flow through future abnormal earnings autoregressively.

When combining the third assumption into Equation 2.4, firm value can be expressed in terms of current-period accounting numbers rather than of future expected value. Ohlson (1995: 670-671) derives a rigorous model based on the above assumptions as follows:

$$P_t = (1-k)BV_t + k(\varphi E_t - d_t) + \alpha V_t \qquad \text{(Equation 2.7)}$$

where φ is a function of the discount rate; and k is a function of the discount rate and the persistence of abnormal earnings, facilitates thinking about the relative importance of book value and earnings. It shows that the valuation model can be viewed as a weighted average of an earnings model and a book value model. Ohlson (1995: 686, Footnote No.7) indicates that for a savings account one obtains $P_t = BV_t = \varphi E_t - d_t$, $V_t = 0$, and the Equation 2.7 holds for every k. Since $E_t^a = 0$, for all t, neither ω nor k is identical.

Many studies (i.e. Ohlson 1995: 670-672; Fetham and Ohlson, 1995: 692-693, Lundholm, 1995: 755-761; Scott, 1997: 143-148; Beaver. 1998: 77-80; Easton, 1999: 401-402; Barth, 2000: 13; etc.) explain that if financial statements are both completely relevant and completely reliable, then investors and managers would have no argument for disagreeing with present value and market value-based accounting as current-value accounting. That is, when accounting is unbiased, all of the firm's value appears on the balance sheet. In effect, the income statement has no information content. However, in practice, this condition does not hold; all items of gain or loss go through the income statement, which is the source of the term "clean surplus" in the theory. The clean surplus theory leads to suggest that the accountant should measure the items in the financial statement as completely and accurately as possible, so as to reduce the need for the market to estimate the future abnormal earnings from other sources (see Equation 2.5, and 2.6). The clean surplus theory predicts that the higher ω, the persistence parameter is, the greater the impact of the income statement is on firm value. Hence, the income statement is important for revealing the current year's abnormal earnings, although the formula reveals that investors will want information to help them assess persistent earnings, because these are important to the future performance of the firm. Therefore, this theoretical framework of Ohlson indicates how the market value of firm can be expressed in terms of the fundamental balance sheet and income statement components and is also cited as the theoretical framework used in several recent studies (e.g. Collins, Maydew and Weiss, 1997: 39-67; Graham, King, and Bailes, 2000: 84-107; etc.).

In summary, this chapter provides a broader view of the segment reporting practice of firms in Thailand and the theoretical framework used. The EMH and equity valuation have an important role in testing the relationship between accounting numbers and share values. Specifically, Ohlson's model helps to distinguish the relation between book value and earnings and the implications of the clean surplus relation for financial reporting. The next chapter will discuss the literature about the usefulness of financial reporting including the empirical evidence of segment reporting.

CHAPTER 3

LITERATURE REVIEW

The overall purpose of financial reporting is to provide information for investor to use in decision-making. The usefulness of decision-making is represented as the most important informational quality. Investors represent a large class among the users of financial statements and they often trade off relevance and reliability for company disclosure. Many studies done in the field of accounting examine the empirical relation between stock market values (or change in values) and accounting information for the purpose of assessing or proving a basis of assessing those numbers' use or proposed use in creating new accounting standards (Holthausen and Watts, 2001: 4). The theoretical framework, as discussed previously, provide some understanding about if such accounting information is associated with stock prices that allow researchers to assess whether accounting information is useful. Not only is accounting information related to share price, but it is also argued that financial statement information can predict future financial performance (i.e. earnings, dividends or cash flows) and thus, such information is useful. In the same way, the claims whether segment data provides incremental information beyond that contained in the firm level data and whether future performance is more strongly associated with segment data than with aggregated information confirm that such information is informative. Section 3.1 reviews empirical evidences relating to the usefulness of financial reporting. Section 3.2 presents empirical evidence on the segmental disclosures.

3.1 The Usefulness of Financial Reporting

The usefulness of accounting information in the decision-making process of investors has been the subject of much academic research since 1968. In mature

markets, such as the U.S., Ball and Brown (1968: 159-178) conducted a pioneer study that examined whether the financial information was useful. Among many academic studies, it is appeared that several types of accounting information (i.e. earnings number, cash flows, sales, etc.) are found to have usefulness. Chapter 3 reviews the empirical evidence relating the usefulness of financial information in foreign countries; Section 3.1.1 and those in Thailand; Section 3.1.2.

3.1.1 The Usefulness of Accounting Information in Foreign Countries

Early research studies determined that accounting information is useful. In 1968, Ball and Brown were the first to provide the empirical evidence that firms' security market prices responded to the information content of financial statements, while Beaver examined trading volume reaction and found that a dramatic increase in volume occurred during the week that earnings announcements were released. Both studies are the origin of empirical capital markets research in accounting that continues to this day and provide the guidance to those who wish to better understand decision usefulness. Both studies are summarized as follows:

Ball and Brown (1968: 159-178) used a sample of 261 New York Stock Exchange (NYSE) firms over the period 1946-1965 to test whether annual earnings announcements have information content. They employed the monthly Abnormal Performance Index (API) to estimate the abnormal security return. Unexpected earnings are obtained from two basic expected earnings models: (a) a regression model, and (b) a naïve model. Unexpected earnings are classified into good news and bad news. If the actual earnings exceed the expected earnings, the researchers call it "good news". Similarly, if actual earnings are less than the unexpected earnings, they call it "bad news". The abnormal returns are calculated in the 11 months prior to and the 6 months following the month of the earnings announcement. The results show that there is an abnormal adjustment of the API around the earnings announcement dates and that there is a positive relationship between the sign of unexpected earnings and the sign of abnormal security returns.

Beaver (1968: 67-92) investigated investor reaction to earnings announcements, in terms of volume and price movements of common stocks in the weeks surrounding

the announcement date. The sample consisted of 143 firms during the years 1961 through 1965. Beaver used the average of the daily percentage of shares traded across all 506 earnings announcements for each week of the announcement period (week –8 to week +8) to examine changes in the volume of trading associated with earnings announcements. The results show that the average volume in the announcement week (week 0) is much larger than in the other weeks and there is a large increase in volume in the earnings announcement week.

Beaver also used the variance of abnormal returns as a measure of the information content of annual earnings announcements. If an earnings announcement conveys information to the capital markets, it causes price changes and the price variability of price change is likely to increase in the week of earnings announcement than in other periods. To compare the abnormal return variance during the report weeks (i.e. the 17 weeks around an earnings announcement, week –8 to week +8) and nonreport weeks, Beaver calculated the relationship between the squared residual in week 0 and the average squared residual during the nonreport period by expressing it in the form of a ratio. If there is no information in an earnings announcement, the abnormal return variance should not change, and the ratio for the announcement week should be approximately 1. If earnings reports possess information content, such a ratio should be greater than 1. The results show that the average abnormal return variance is larger than in the week of the announcement of annual earnings. The ratio at time 0 is 1.67. This leads to the conclusion that the announcement of annual earnings contains information relevant to the valuation of securities.

Lev (1989: 153-192) assessed the usefulness of earnings data to investors and used this assessment to reexamine the accounting research agenda in the return-earnings studies. The results show that the correlation between earnings and stock returns is very low. The researcher implies that the usefulness of quarterly and annual earnings data to investors is very limited. He tries to explain that the possibility of the low returns/earnings association is caused by the shortcoming of methodologies that researchers use to capture the usefulness, e.g. the relationship between returns and earnings seems nonlinear, etc., and is also caused by investor irrationality. If the investors err in information interpretation, or overact to or ignore relevant information, the association between stock returns and value relevant information is

low. Finally, the quality of earnings is low. The low quality is related to the impact of accounting techniques and occasionally management manipulation.

Easton and Harris (1991: 19-36) examined whether the level of earnings divided by price at the beginning of the stock return period is relevant for evaluating earnings/returns associations based on the sample during the year 1969-1986. The univariate regressions of returns and the earnings levels and changes variable show that the explanatory power (R^2) based on the level model is 7.5% compared to the R^2 of 4% from the equivalent regression for the change model. While the multivariate regressions of returns incorporating both earnings levels and changes measures show that the coefficient on levels are significant in all 19 years, the coefficients of changes variables are significant only in 8 out of 19 years. The results imply that both earnings variables are relevant for explaining returns, and that the two variables are complements in the sense that, for the pooled sample and for several individual years, significantly more of the cross-sectional variation can be explained by both the earnings levels and the earnings changes than by either variable considered alone.

Alford et al. (1993: 183-223) compared the information content and timeliness of accounting earnings in many countries using the U.S. as a benchmark. The sample of non-U.S. firms includes Australia, Belgium, Canada, Denmark, France, Germany, Hong Kong, Ireland, Japan, the Netherlands, Norway, Singapore, South Africa, Sweden, Switzerland, and the U.K. The researchers restricted their sample to industrial firms to increase the homogeneity of their sample. Their research design is based on a country-by-country comparison of non-U.S. firms with firms in the U.S. To control for differences in industry, market capitalization, and time, the researchers randomly selected 100 matched U.S. sample firms for each non-U.S. sample firm. That is, they randomly selected a U.S. firm in the same year, industry group, and market value of equity quintile for each non-U.S. firm-year observation. The researchers then performed two types of analyses. The first analysis compared the relation between stock returns and accounting income for each of the non-U.S. samples with the corresponding matched U.S. samples. The second analysis estimated a regression model of 15-month stock returns on the contemporaneous level and changes in earnings. The results indicate that relative to the U.S., accounting earnings

are more value relevant in Australia, France, the Netherlands, and the U.K., but somewhat less value relevant in Belgium, Denmark, Hong Kong, and Sweden. In the same way, the researchers studied the association between annual accounting earnings and stock returns and found that earnings regression explained a greater proportion of the returns for Australian and U.K samples than for their matched U.S. firms and significantly less for the samples from Germany, Ireland, and Sweden. These results imply that differences in capital markets – accounting standards, disclosure practices, and corporate governance – lead to significant differences in the usefulness of accounting earnings.

Finger (1994: 210-223) tested the ability of earnings to predict future earnings and future cash flow from operations, one through eight years ahead, by using the annual data for 50 firms from 1935–1987. The results indicated that past observations of earnings are useful in predicting earnings for the majority of sample firms. Tests of earnings to predict future cash flow from operations show that earnings are a significant predictor of future cash flow. The researcher also tested whether earnings provide incremental predictive ability in the presence of cash flow. She found that earnings provide incremental content for most firms. Moreover, the researcher compared the ability of earnings to predict future cash flow with the ability of cash flow to predict future cash flow. The results show that current earnings are a better predictor of future cash flow than is current cash flow.

Although the above studies mention that earnings have value relevance, several recent studies, by using different research designs, (Collins, Maydew and Weiss, 1997: 39-67; Lev and Zarowin, 1999: 353–385; Ely and Waymire, 1999: 293-317; Francis and Schipper, 1999: 319-352) provide evidence for a decline in the relevance of earnings over the last 20 years. These studies are summarized below.

Collins, Maydew and Weiss (1997: 39-67) investigated the systematic change in the value relevance of earnings and book value over time, specifically, over the period 1953-93. They employed a valuation framework provided by Ohlson (1995), which expressed price as a function of both earnings and the book value of equity, and used R^2 as the primary metric to measure value relevance. The researchers separated the combined explanatory into three components: (a) the explanatory power common to both earnings and book value, (b) the incremental explanatory power of earnings, and

(c) the incremental explanatory power of book value. They find that the value relevance of earnings has decreased over time, having been replaced by an increased value relevance of book value.

Ely and Waymire (1999: 293-317) considered whether earnings relevance was increased by the following: (1) the empowerment of the Committee on Accounting Procedure (CAP) in 1939 as the first U.S. standard-setting body, and (2) subsequent reorganizations of the standard setting process which led to the establishment of the Accounting Principles Broad (APB: 1959-73) and the Financial Accounting Standards Broad (FASB: 1973-present). The researchers selected a random sample of 100 NYSE firms from 1927-1993. They examined the explanatory power of yearly cross-sectional regressions of 16-month market adjusted stock returns in relation to annual earnings changes and levels. They also used both earnings changes and levels, since the levels improve the specification of the earnings-returns relation. The market-adjusted return equals the difference between the firm's return over this interval and the return on the Center for Research in Security Prices (CRSP) equally weighted index of NYSE stocks. The researchers compared adjusted-R^2 and found that the results did not support the hypothesis that relevance was significantly higher after the reorganization that created the APB and the FASB, but that there was weak support for higher earnings relevance in the CAP era compared to the pre-CAP era.

The researchers then extended this test by incorporating the summary measures from both the income statement and the balance sheet. That is, they estimated the yearly cross-sectional regressions with price as the dependent variable and both earnings and book values included as independent variables. The results show that the incremental relevance of earnings did not exhibit significant increases following empowerment of the CAP or the reorganizations created by the APB and the FASB. The combined relevance of earnings and book value data increased during the FASB era because of increases in the incremental relevance of book value.

Francis and Schipper (1999: 319-352) examined the concern that financial statements have become less value relevance over time, specifically, over the period 1952–1994. They measured a loss of relevance as a decrease over time either (a) in the total return that could be earned from foreknowledge of financial statement information or (b) in the explanatory power of accounting information for market

value. The first measure focused on the market-adjusted returns that could be earned from using the foreknowledge of financial statement information during the period 1952-1994. The market adjusted return is defined as the compound (with dividend) return minus the return on the equally weighted market portfolio. The researchers computed the 15-month market-adjusted returns of five hedge portfolios formed on the basis of accounting information: (a) the sign of change in earnings before extraordinary items, (b) the sign and magnitude of change in earnings, (c) the basis of the percentage change in cash flows, (d) fundamental values derived using Lev and Thiagarajan's (1993) financial ratio model – fundamental signal, and (e) the returns-book value and earnings regression. The results show that a significant declines in the returns to three of the five accounting based hedge portfolios – namely, the hedge portfolio formed on the basis of the sign and magnitude of change in earnings, fundamental signal, and the returns-book value and earnings regression).

In addition, the researchers considered the explanatory power of accounting information on market value by assessing the ability of earnings to explain annual adjusted returns, and the ability of earnings and book values of assets and liabilities to explain market value of equity. They also tested the significance of the over time change in ability of accounting information to explain variation in market measures by regressing adjusted-R^2 on time variable. The results for the earnings relation imply a decrease in explained variation overtime, whereas the balance sheet relation or the book value and earnings relations show no evidence of a decline in value relevance. These results conclude that a decline in the relevance of earnings information, and increase in the relevance of balance sheet and book value information.

Lev and Zarowin (1999: 353–385) studied that the usefulness of financial information has been deteriorating over the past 20 years, as explained by a weakening association between capital market values and key financial variables – earnings, cash flows, and book values. The researchers first examined the usefulness of reported earnings by using the returns – earnings association. The results show that the R^2 has declined during the period 1977–1996. The regression of the annual R^2 s on time variable also indicates that the decrease is statistically significant. Similarly, the sum of slope coefficients on the level and change of earnings (or earnings response coefficients: ERCs) has been decreasing. The regression of yearly ERCs on

time also confirms that the ERC's decline is statistically significant. Next, the researchers estimated the following cash flows – returns relation. The results show that the association between operating cash flows (plus accruals) and stock returns, as measured by R^2, decreased over the sample period, but is not stronger than the association between earnings and returns. The researchers also examined the value relevance by regressing stock prices on earnings and book value. The results show that the R^2 decreased over the period 1977–1996.

Overall, most prior studies done in foreign countries (i.e. U.S.) found that accounting information is useful. The next section will present the usefulness of accounting information in Thailand.

3.1.2 The Usefulness of Accounting Information in Thailand

A few empirical studies in Thailand, unlike those of U.S., provide evidence on the usefulness of financial information. Most early studies (Suchitra Vacharajittipan, 1991: 1-144; Pimpana Srisawadi, 1996: 1-270) examined the information content of earnings and find that earnings number is informative. Kanogporn Narktabtee (2000: 87-111) also found that revenue information is useful. Moreover, Graham, King and Bailes (2000: 84-107) and Punya Sumritpradit (2002: 1-198) suggest that Thai book value and earnings have value relevance. Details regarding each study are summarized as follows.

Suchitra Vacharajittipan (1991: 1-144) examined the information content of quarterly accounting earnings announcement on the Thai stock market from January 1986 to March 1991. She employed a seasonal and a non-seasonal model to predict expected quarterly earnings, and then calculated the unexpected earnings as the difference between earnings actually reported and expected earnings. She classified unexpected earnings into two groups: (a) good news, and (b) bad news. Similarly, the unexpected returns were obtained by calculating the difference between actual returns and expected returns. The expected returns were based on the market model. The unexpected returns were accumulated over 21 days surrounding the earnings announcement dates. That is, 10 trading days before and after the earnings announcement date, and the announcement date itself. The researcher then classified into portfolios: (a) cumulative abnormal returns (CARs) caused by positive

unexpected earnings, and (b) CARs caused by negative unexpected earnings. She found that CAR of each portfolio to not be equal to zero which confirmed that there is information content of earnings around the announcement dates. According to t-statistical analysis, the results show that the CARs around the earnings announcement dates are statistically significantly greater than zero and increase over time around the announcement dates. She concluded that there is information content of quarterly earnings announcement in Thailand.

She further examined whether there is a positive association between returns and earnings. She measured the correlation coefficient as the strength of relationship between earnings changes and stock price change. The results show that there is a positive relation between positive unexpected earnings changes and stock price, while there is a negative relationship between the negative unexpected earnings changes and stock prices. Suchitra Vacharajittipan (1991: 120-121) indicates that investors who invest in the Thai stock market do not have sufficient awareness of the value that accounting information contains to make investment decision. Thus, investors may pay more attention to other variables (i.e. economic and political situation, the reputation of management team) when making investment decision. That is, although earnings decrease, stock prices may still increase, if the other variables show good signs for investment.

Pimpana Srisawadi (1996: 1-270) examined whether earnings contained useful information for investors in pricing securities. The sample includes all companies listed in the Stock exchange of Thailand with the data available on the Pacific-Basin Capital Markets (PACAP) database during the period of 1975 to 1991. She first considered the returns-earnings relationship over a one-year window and the change in this relationship over time. Monthly returns were used to study the long-term relationship between returns and earnings. She measured the slope of coefficient from a regression of annual unexpected earnings and abnormal returns accumulated over a long-term window. She found that there is a positive association between returns and earnings over a long-term window in Thailand. The unexpected earnings information in Thailand always has a positive coefficient indicating that earnings information contains information useful in pricing securities in Thailand.

She further considered whether the market reacts to the release of earnings information. She measured the slope coefficient from a regression of cumulative abnormal returns surrounding the earnings announcement date on the quarterly unexpected earnings. The abnormal return is calculated as follows: (a) the market adjusted return model: the difference between the sample firm's return and the market's return, and (b) the size adjusted portfolio approach: the difference between the sample firm's return and the return for a portfolio of firms which are similar in size to the sample firm. Cumulative abnormal returns are estimated by summing the daily abnormal returns for the event window. She also employed three return windows to examine the period that the market reacts to the earnings announcements: (a) [-1, +1], (b) [-15, -1], and (3) [+1, +15] window. The [-1, +1] return window is employed to test whether there is an instantaneous market reaction to the announcement date. The [-15, -1] window is considered whether there is an anticipatory price change to quarterly earnings information prior to the announcement of earnings date. The [+1, +15] window is designed to consider how much of the market reactions are permanent. The results show that there is an instantaneous market reaction to the announcement of earnings as well as an anticipatory price change prior to the announcement date. There is no strong post announcement drift.

Kanogporn Narktabtee (2000: 87-111) examined the value relevance of accounting information such as revenue, earnings, and cash flows information that include cash flows from operating, financing, and investing activities.on the Thai market to test which performance measure provided greater value relevance to stock price. However, she finally excluded cash flows from investing activities, because of the multicollinearity between the cash flows from financing and investing activities. She employed the sample in SET during 1994-1997. She examined the relative value relevance using the comparison of adjusted-R^2 of regression models of each individual measure on price, and the comparison of standardized coefficient estimated from the standardized regression model. The results show that each accounting information has value relevance, specifically, earnings and cash flows from financing activities are the most value relevant to stock price.

Graham, King and Bailes (2000: 84-107) examined the consequences of economic turmoil in Thailand on the association between accounting information and

the market values of Thai firms. They considered the association between Thai accounting information and Thai market prices before and after the 1997 devaluation of the baht. They took data from the Integrated-Stock Exchange of Thailand (SET) Information Management System (I-SIMS) database, including market value, earnings and book value from the first quarter of 1992 through the first quarter of 1998 (25 quarters). The results were analyzed by measuring relative value relevance based on R^2. The researchers used market value per share measured two months after the end of a reporting quarter as the dependent variable, while book value per share and earnings per share were independent variables. They also used indicator variables of each industry to control for industry differences in capitalization rates. The results show that Thai book values and earnings have value relevance, but the relation between market prices and accounting numbers changes over their sample period.

The researchers further tested the differences around the period when the baht was devalued by limiting the sample to four quarters before July (the before period) and to the four quarters after July 1997 (the after period). The value relevance of accounting information appears greater in the before period. Moreover, the results of Chow (1960) tests suggested significant declines in the value relevance of book value and earnings after the devaluation of the baht. One implication is the volatility of foreign exchange gains and losses.

Punya Sumritpradit (2002: 1-198) considered changes in the value relevance of earnings and book values over the period 1984–99. He employed correlation analysis and the Feltham-Ohlson Model (1995) for pooled, and yearly cross-sectional regression analysis. He indicates that the earnings and book value can explain security price, but the combined value-relevance of earnings and book value does not increase over time, does not increase in the period of accounting standard changes, and does not significantly differ among industries. The results show that earnings are more value relevant than book value. Earnings growth and earnings permanence are the factors influencing earnings, while one-time items, loss from major operations, firm size, revaluation of assets, and foreign currency transactions are the factors influencing book value.

In summary, although differences in capital markets – accounting standards, disclosure practices, and corporate governance – lead to significant differences in the

usefulness of accounting earnings, accounting information (i.e. earnings and revenues) has been important in Thai empirical studies, like those of the U.S. However, the information as mentioned above is firm-level data, while one of the predominant characteristics of today's business world is the diversification of companies into different business sectors. Consolidated financial statements of multi-product companies may not be used to evaluate the performance and position of the company in relation to other entities operating in the same areas, because the individual set of activities of each group is different. Therefore, additional information including disaggregated or segmented financial information is also needed. Details regarding of empirical evidences of segmental disclosures are discussed in the following section.

3.2 The Empirical Evidences of Segmental Disclosures

Segment reporting became the controversial issue in the U.S. during the 1960s with the rise of conglomerates (Mohr, 1983: 40; Baldwin, 1984: 377; Mande and Ortman, 2002: 31). Because consolidated financial statements involve the aggregation of information about various segments of a firm into a single financial report, and because different segments of a firm usually are in different industries and regions with significantly different sales, profitability, riskiness, and future growth opportunities, revenues and income from different segments are likely to have different implications for future cash flows of the total firm. For example, revenues or income from a high growth segment, unlike a low-growth segment, are likely to be associated with higher levels of future cash flows. Different risks imply that different discount rates are to be used to discount the cash flows of each segment. Hence, segment disclosures provide the users of financial reports with a tool to identify and analyze the opportunities and risks that diversified companies face.

There are a number of empirical evidences on segmental reporting. This section describes those empirical evidences on (a) segment reporting in practice, and (b) the usefulness of segmental information.

3.2.1 Studies on Segment Reporting in Practice

This line of research is to examine the nature and the consistency of segmental disclosures. For example, Emmanuel and Gray (1977: 37-50) and Rennie and Emmanuel (1992: 151-159) considered the consistency and compatibility of the basis of disclosures used with other available information (i.e. other information contained in the annual report, and/or U.K. Standard Industrial classification), while Emmanuel and Garrod (1987: 235-240) reported the views of a group of preparers and users of segment reports on the segmental reporting issue. Furthermore, various recent studies (i.e. Herrmann and Thomas, 2000: 287-302; Nichols, Street and Gray, 2000: 59-82; Street, Nichols and Gray, 2000: 259-285; Street and Nichols, 2002: 91-113) concentrate on comparing the nature of disclosures between the new accounting standard (SFAS No.131/ IAS No.14R) and the old one (SFAS No.14/IAS No.14) Details of each study are summarized as follows.

Emmanuel and Gray (1977: 37-50) studied the quality of disclosure with respect to the consistency of segment reporting. They surveyed thecompany reports of the largest 100 U.K. quoted industrial companies for 1975/6. Their first concern about the quality of disclosures focused on the consistency and compatibility of the basis of disclosure used with other available information in an individual company's report. The results show that of the 78 companies providing segmental disclosures of business activities only 35 companies provided information which was consistent with supplementary disclosures, as gathered from the chairman's review/directors report, about the company's organization. The remaining 22 companies provided a single class of business disclosure and 19 (86%) companies provided information which was inconsistent with supplementary disclosures about the company's organization. Their second concern focused on the consistency of disclosures or non-disclosures with respect to the external classification of business activities, such as the U.K. standard industrial classification. The results show that 67% of the disclosing companies at the order level (1 digit) and 32% at the 3 digit level are consistent with the standard industrial classification system. In contrast, the companies that provided only a single class of business disclosures show that 7 of 22 companies at the order level and 4 of 22 companies at 3 digit are consistent with the standard industrial classification system. The researchers imply that for those

disclosing companies whose disclosures are inconsistent, such inconsistencies arise from difficulties with respect to feasibility, a lack of relevance for a particular company, or an unwillingness to provide analyses which are in consistent. For those single class companies, there is likely to be little meaning which could be given by users to the information disclosed about the company's performance. The researchers considered whether supplementary disclosures about a company's organization of its business activities are in fact consistent with the U.K. standard industrial classification. To the extent that they are consistent with the standard industrial classification then any difficulties of feasibility or relevance with respect to disclosure by particular companies on this basis would seem to necessarily disappear. The results show that there is some reluctance or unwillingness by many companies to make meaningful disclosures. Alternatively, it may indicate ignorance on their part for improving the quality.

In addition to considering separates classes of business, Emmanuel and Gray examined the level of international disaggregation. In a survey of the largest 100 firms, they found that 87 companies provided data on their international operations, 12 companies did not provide international analysis, and only one company did not have overseas operations. Among 87 companies providing the international operations, 12 companies provided a single U.K./Overseas split, 5 companies provided their segmental disclosures by country, 46 companies provided their segmental disclosures by continent, 7 companies provided their segmental disclosures by hybrid of continent and country, and the remaining 17 companies provided their segmental disclosures by continent but confused because of aggregation. However, a large proportion of companies provided information which was not consistent with how they see their own international business activities based on supplementary disclosures in their company reports. Similarly, no single area of disclosure provided information consistent with supplementary disclosures about the company's organization. The results also show that only 52 of 100 companies provided U.K. performance data as distinct from overseas performance data for both turnover and profit. Overall, these results appear on balance that a finding in the negative is appropriate. Therefore, a problem of identifying separate classes of businesses, and of international operations would seem to exist.

Gray and Radebaugh (1984: 351-360) investigated the extent of geographic information provided in practice in the U.S. and U.K., and the significant differences in the nature and content of disclosures between countries both in terms of voluntary disclosures and those required by accounting standards. The authors examined the extent of disclosures in a survey of reporting practices of 58 U.S. and 35 U.K. multinational enterprises based on these companies' 1979 annual reports. This sample met the following criteria: (a) foreign operations in at least four countries, (b) foreign sales of at least $500 million (for U.S. firms) and £250 million (for U.K. firms), and (c) foreign sales of at least 30% of consolidated sales revenues. The results show that the extent of disclosures in the U.K. is relatively low, while U.S. firms disclose more segment information. That is, in the U.S., consistent with SFAS No.14, there is a 100% response rate regarding sales and profits, and a 97% response for assets, while in the U.K., consistent with U.K. regulations, 97% of the firms disclosed sales, and 74% profits. Turning to voluntary disclosures, 37%, 26% and 37% of U.K. firms voluntarily provided geographic analyses of assets, new investment, and employees, respectively. In contrast, 31% and 10% of U.S. firms provided geographic analyses of new investment and employees respectively. In addition to the content of international segment disclosures, the authors examined the extent of disaggregation. The average number of geographic segments disclosed by U.S. firms tends to less than U.K. firms, and there is a general tendency toward a high level of aggregation with segments often identified on a multicontinental basis.

Emmanuel and Garrod (1987: 235-240) reported the views of a group of preparers and users of segment reports on the segmental reporting issue. Sixteen investment analysts were chosen at random from a wide cross-section sample of private brokerage firms and institutional investment companies are interviewed during April-August 1985 at the analysts' offices in the City of London, in order to discover what use, if any, the analyst has for segment reports. In addition to users' views (analysts' perspectives), the authors interviewed the Finance Directors, Chief Accountant or Head of Accounting Policies of six companies to obtain the preparers' views. All companies have world-wide operations, and five of the six companies disclosed segmental data in excess of the Companies Act, 1981 requirements and the majority used a matrix presentation. The authors revealed that most firms recognize

geographic segments on a basis broadly in line with continents, while the basis for identifying business segments appear to be even more diverse. For example, three companies used the organization structure, two used the different product-market served, and one used the industrial classification which also coincided with legal entities. No companies seem to carry out a regular reappraisal of how reported segments are identified. Changes in disclosure practice are only occasioned by an acquisition or sales, the creation of a new operating division or a market change in market contribution. All companies agree that accounting problems associated with the allocation of costs and transfer pricing have no influence over the identification of segments reported, but the identified segments realistically reflect the company's operations in a consistent manner over time. Perceptions of competitive disadvantage, legal requirements and internal policies condition the financial data disclosed. The main concern of users is that users prefer more detailed break-downs of the business and geographic segments with more financial data but a general concern appears to relate to the consistency of the segmental disclosure with other data provided in the annual accounts and reports.

Rennie and Emmanuel (1992: 151-159) compared the extent and quality of segmental disclosures over thirteen period. The disclosure practices of the same group of seventy companies were compared for the reporting years 1975-6 and 1988-9. The extent of segmental disclosure analysis is determined based on business activities and geographic activities, while the quality of segmental disclosures is considered by comparing the consistency of the segmental disclosures with other information contained in the annual reports. The results show that the extent and quality of business segment disclosures has improved, but there are a few persistent non-disclosures. The justification for non-disclosure companies appears difficult to uphold, given that the supplementary data is found elsewhere in the annual report. In the perspective of geographic activities, the results show that the extent of geographic segment disclosures seems to have declined in the period, specifically profit before tax identified by distinct geographic segments is provided by fewer companies than was the case thirteen years ago. The quality of geographic segment disclosures seems to have changed most markedly with respect to improved consistency with the listing of subsidiaries. A tendency to report segments by a mix of country and continent is

also apparent. Some 14% of companies failed to provide any segment information although their annual reports specifically mentioned overseas operations.

Herrmann and Thomas (2000: 287-302) compared the segment reporting disclosures under SFAS No.131 with those reported under SFAS No.14. They analyze the segment disclosures of 100 of the 250 largest U.S. firms in the year before and the year of adoption of SEAS No.131. The results show that over two-thirds of the sample firms redefined their primary operating segments upon adopting SFAS No.131. Ten of the 100 firms in their sample provided segment information for the first time under SFAS No.131. Both the number of segments and the number of items disclosed for each segment increased under SFAS No.131. The enterprise-wide geographic disclosures increased the proportion of country-level geographic segments with a corresponding decrease in the proportion of broader geographic area segments. However, when earnings were no longer required to be disclosed for enterprise-wide geographic disclosures under SFAS No.131, the number of firms reporting earning by geographic area declined.

Nichols, Street and Gray (2000: 59-82) assessed the impact of the newly effective SFAS No131 compared to that of SFAS No.14. The key issue concerns the extent to which companies have responded to the changes in geographic information disclosures required by SFAS No.131. Annual reports for 1997 and 1998 for 158 U.S. companies listed in the Business Week Global 1000 were analyzed. The results show that of the 158 companies, only 13 had reportable segments based on geographic area while a further 22 had reportable segments based on a mix of geographic area and line of business that take on one of three basis formats, that is, 8 companies reported lines of business plus international segments, 13 companies reported some line of business split by geographic location, and 1 company reported all lines of business split by geographic location. The remaining 123 companies also provided geographic enterprise-wide data in 1998. The results reveal that although more country specific data was disclosed and the consistency disclosures with other parts of the annual report increased, the problem of reporting highly aggregated geographic areas remained for a significant group of companies.

Street, Nichols and Gray (2000: 259-285) provided information about SFAS No.131 disclosures in practice and more importantly to ascertained whether SFAS

No.131 addressed the main concerns expressed regarding segment reporting under SFAS No.14. Specifically, they claimed that the new requirements have resulted in (a) a greater number of the line of business segments for some enterprises, particularly those who claimed to operate in one line of business under SFAS No.14, (b) enterprises reporting more items of information about each segment, and (c) improved consistency of segment information with other parts of the annual report. The 160 companies used in the study was chosen from U.S. Global 1000 companies for both 1997 and 1998 to ascertain the impact and effectiveness that SFAS No.131 has in practice. The results show that only 19 firms claimed to operate in one reportable segment, 13 companies determined reportable segments based on geographic locations, and 22 determined reportable segments based on a mix of line of business and geographic location. This leads to 106 companies that determined reportable segments based on line of business. In addition, SFAS No.131 has been effective at increasing of the line of business segments reported by some companies, specifically those that had previously claimed to operate in one line of business under SFAS No.14. There have been significant changes in reporting from the time of SFAS No.14 including increased consistency with information in the management discussion and analysis, as well as other annual report disclosures.

Street and Nichols (2002: 91-113) investigated the pre-IAS 14R and post-IAS 14R line-of-business and geographic disclosures of a global sample of companies that refer to IAS to determine the impact and effectiveness of IAS 14R in practice. The sample consisted of 210 firms based on the IASC list of companies and acquires from writing or e-mailed to request an English language annual report for 1998 and 1999. Each of the 210 sets of annual reports was analyzed. The findings show that 33% of 210 companies did not report primary segment data under 14R. Such companies claim to operate in one line-of business. 11% determined reportable primary segments based on geographic location, while 56% were managed and determined reportable primary segments based on line-of-business. The results also show that the number of companies claiming to operate in one line-of-business also declined significantly by considering a Chi-square test. Moreover, IAS 14R caused a significant increase in the number of items of information disclosed for each primary and secondary segment. That is, a paired t-test indicates that there was a statistically significant increase in the

number of companies disclosing sales data, a profitability measure, and asset, when compared to the specific items of primary segment data that was provided by companies prior to adoption of IAS 14R and following adoption of IAS 14R. In addition to items required by both IAS 14 and IAS 14R, paired t-tests indicate that the increased level of disclosure was significant for each of the newly required disclosures (i.e. liabilities, capital additions, depreciation, other non-cash items, and equity method item). The consistency of segment information contained in the introductory annual reports also increased significantly while a significant minority continued to report segment information on a basis inconsistent with other sections. Many companies continued to utilize broad, vague geographic groupings.

Overall, a problem of identifying and separating the classes of business, and of international operations seems to exist. Nonetheless, there was a significant increased in the consistency with regard to information in the management discussion and analysis, as well as other sections of the annual report disclosures. Importantly, when earnings were no longer required to be disclosed for enterprise-wide geographic disclosures, like SFAS No.131, the number of firms that reported earnings by geographic area declined. The next section discusses the empirical evidence about the usefulness of segmental disclosure.

3.2.2 Studies on the Usefulness of Segmental Information

Many studies, including Collins (1976: 163-177); Ajinkya (1980: 343-361); Baldwin (1984: 376-389); Swaminathan (1991: 23-41); and etc., done from the perspective of decision usefulness have found that segment data improved earnings prediction, but most studies concerning the relationship between segment disclosures and security returns are inconclusive. The literature review in the following section is thus classified into two groups: (a) the studies of expected returns/stock value effects, and (b) the studies of earnings prediction effects. Details regarding each aspect of the usefulness of segmental information studies shall be discussed as follows:

3.2.2.1 Studies of the Expected Return Effects/Stock Values Effects

Kochanek (1974: 245-258) examined the effects of segmental financial disclosure by diversified firms on earnings predictability and stock price volatility. Correlation models and a variability model, based on security prices, are employed to

examine the market reaction to published annual financial reports for a sample of thirty-seven diversified firms, which disclosed varying amounts of segmental data during 1966-1969. Kochanek developed a quality ranking reflective of the varying degree of fineness by classifying each firm as either a good or poor reporter of segmental data (the good reporters consist of firms that disclose, at least the minimal desired amount of subentity details, complete segment descriptions and corresponding gross revenues). Twenty-four firms out of thirty-seven firms were classified as good reporters, the remaining thirteen firms are poor reporters.

To relate the quality of disclosure categorization to earnings prediction and return assessment, Kochanek calculated changes in annual earnings per share and four associated sets of stock prices changes. The four sets of stock price changes are computed over the four different time periods, designed as long-term, intermediate, short-term, and current. Earnings predictability was measured by correlations between changes in annual reported earnings per share figures and changes in stock prices computed over time periods which preceded (led) and succeeded (lagged) the earnings change observation year. The degree of association between earnings changes and stock price changes is measured by the Spearman rank correlation coefficient. The 37 resultant coefficients are ranked, and the null hypothesis of no difference in the median ranks of the good and the poor reporters is tested. The null hypothesis is rejected and the results show that for long-term and intermediate price changes, the correlations associated with the good reporters are larger than those associated with the poor reporters, while for the short-term and current price changes, the larger correlations belonged to the poor reporters. These results suggest that an earlier market anticipation of earnings changes is associated with the disclosure of good segmental data.

Kochanek further investigated whether firms disclosing subentity results exhibited lower weekly stock price variability than firms not revealing such data. The measure of variability is a computation of the observed weekly stock price range as a percent of average weekly price. The results suggest that firms disclosing subentity results exhibit lower weekly stock price variability over time than firms not providing such information, although the quality of a firm’s stock in terms of the historical

growth and stability of earnings and dividends is a more important factor in explaining price fluctuations.

Horwitz and Kolodny (1977: 234-249) studied the information content of segmental disclosure with respect to market risk assessments. They set two objectives. The first one is to examine whether the perceived risk characteristics of firms changed significantly when the previously nondisclosed information became public. Another one is to examine whether the added disclosure contained other information which led investors to revalued securities at the time of disclosure.

The authors selected 50 firms required in 1971 to report to the SEC for the first time on a line of business basis as treatment group and 50 firms which in 1971 reported all information to the SEC on a consolidated basis only as a control group. Data from each of the 100 companies consisted of two sample monthly price and cash dividend data adjusted for stock dividends and splits for the nine-year period 1965-1973. The time period of nine years was divided into three subperiod for analysis: (a) a six-year period (1965-1970) – before the change in the reporting requirement (predisclosure), (b) a one-year period (1971) – surrounding the time in which the change in reporting requirement took effect (disclosure), and (c) a two year period (1972-1973) – following the change in the reporting requirement (postdisclosure). The authors then employed the market model to assess beta coefficients by regressing for each firm monthly returns on market returns for each period.

Market returns are computed using the Standard & Poor's Composite Index. To measure the change in market risk, the absolute value of the change in beta from the predisclosure to postdisclosure periods is computed for each security and averaged for each of the two groups. The averages of the absolute value of the differences are computed because there is no a priori reason to believe that the additional information would either increase or decrease market risk. The results showed that there is no significant change in systematic risk as a result of the disclosure of SEC mandated segment data.

Based on the second objective, the authors also measure the unexpected returns that were realized on the securities of the line-of-business reporting firms close to the time that additional information was disclosed. If investors in analyzing the reported information altered their expectations regarding future firm performance,

this behavior should be reflected in unusual security price and return changes. To evaluate the effects of disclosure on security returns, a cross-sectional average of the residuals of the individual companies in each sample was taken for each month. Monthly values of the average absolute value of the residuals of companies in each sample were also calculated, because there is no prior reason to believe that a line of business effect, if such existed, would manifest itself consistently across all companies only in either abnormal price increases or abnormal price decreases. If reaction to this information affected firms differently, causing abnormal price increases for some firms and abnormal decreases for others, the effect could be obscured by examining average residual in each month alone. In addition to monthly averages, two cumulative measures of abnormal are calculated for each sample: (a) a cumulative average residual, and (b) a cumulative average absolute residual. The results show that (a) no apparent differences exists in the average or cumulative average residuals between the line-of-business group and the non-line-of-business reporting group in the months surrounding the reporting period, (b) no apparent differences exists on the average absolute value or cumulative average absolute value of residuals between the line-of-business reporting group and the non-line-of-business reporting group, and (c) no apparent differences exists in the residual statistics for the line-of-business reporting group over time.

Ajinka (1980: 343-361) examined the effects of both pre-and post-1970 segmental disclosures on mean returns and in the covariance structure of returns. That is, the test period was divided into two subperiods: (a) the before line-of business requirement test period during April 1966 – March 1970; and (b) the after line-of-business requirement test period during April 1973 to March 1976. The author also classified the sample into two treatment groups: (a) multi-product firms that had not publicly disclosed either segment revenues or earnings during the 1966-70 period, i.e. prior to the SEC's line of business requirement (hereafter refer to T1); and (b) multi-product firms that disclosed only segment revenues (but not earnings) prior to 1970 (hereafter refer to T2). The two control groups also consisted of (a) multi-product firms that had voluntarily disclosed both segment revenues and earnings prior to 1970 (hereafter refer to C1); (b) single-product firms for whom segmental disclosure was not applicable (for the entire period 1966-75 - hereafter refer to C2). Both of

treatment groups (T1 and T2) and a former control group (C1) had to disclose revenues and earnings by segment after 1970. The final sample consisted of 172 firms (56 firms in group T1, 52 firms in group T2, 35 firms in group C1, and 29 firms in group C2). The dependent variable is the average monthly market-risk-equalized returns for each portfolio of firms represented by the four groups of interests (T1, T2, C1 and C2). The independent variable is the type of line of business disclosure.

Given the hypothesis that accounting earnings forecast errors and contemporaneous security returns residuals are significantly associated, the sign of the earnings forecast error of each firm in each year is used to partition each group into negative forecast error (N) and positive forecast error (P). Thus, the author yielded the eight subgroups (i.e. TIN, TIP, T2N, T2P, C1N, C2N, and C2P). The earnings forecast error is defined as the difference between the actual earnings and forecasted annual earnings. The results show that there are no significant differences among the mean returns of the firms that represent the different levels of line of business disclosures. The comparison of before- and after- line of business requirement also show that there are no statistical significant differences. Ajinkya (1980: 359) notes that "a priori, it is not possible to predict the direction of the change in the average returns of a portfolio of firms that go from less fine to more fine information reporting. The primary reason is that, for an individual firm, the mean returns could be revisited either upward or downward depending on the nature of the finer information that becomes available. Hence, the individual effects may be largely neutralized at the portfolio level and not show up in the above tests on portfolio means."

Swaminathan (1991: 23-41) examined further the economic impact of the 1970 segment-reporting requirement by using the different methodology and found that pricing effects exists. That is, the researcher reexamined the security price impact of SEC mandated segment data and extends the earnings prediction studies by examining the impact of segment data on the divergence of beliefs of multiple financial analysts' earnings forecasts. The sample was divided into a control group (101 firms) and experimental group (160 firms) based on the level of segment disclosures prior to the SEC mandate. The results show that there is a significant increase in price variability and a significant decrease in the divergence of beliefs.

There are no such effects for the control group. Moreover, the percentage change in price variability of the experimental group is higher than that of the control group. The decrease of the divergence of beliefs is also significantly greater for the experimental group than for the control group. Swaminathan also tested whether there was a relationship between the percentage change in price variability and the number of segments by running a regression of the average percentage change in price variability on the number of segments. The researcher further tested whether there was an association between the percentage change in divergence of beliefs and the number of segments. The magnitudes of increases in price variability and decreases in the divergence of beliefs were also found to be directly proportional to the number of segments. There were no such effects for the control groups.

Aitken, Czernkowski and Hooper (1994: 65-77) examined whether segment disclosures provide information useful for earnings prediction. Using a short-event window design, the authors compared for two groups of firms over a defined period (five days before to two days following) around the earnings announcement dates. One of the groups provided segment disclosures on a voluntary basis for at least one year prior to 1983. The firm had to have lodged an annual report with the Australian Stock Exchange in both 1983 and 1987. The final sample consisted of 33 firms including three different types of segment reporting groups: (a) those that provided industry segment earnings disclosures, (b) those that provided industry segment revenue disclosure, and (c) those that provided both industry segment earnings and revenue disclosures. Another group contained control groups including the 38 single segment firms and the 38 diversified non-disclosures. The control group was matched on industry and size. Thus, the authors tested whether firms that provided any form of segment disclosures allowed investors to predict earnings better. This was done by regressing cumulative abnormal returns against firm unexpected earnings within each group with the 1983 data and re-running that regression with the 1987 data.

The results show that firms providing segment disclosures in general and firms which provide both segment earnings and revenue have significantly less surprise associated with their earnings announcements than a sample of diversified non-disclosures after controlling for unexpected earnings. These results imply that the

earnings of firms providing segment disclosures are more predictable than those of firms which chose not to supply segment disclosures. However, when breaking down the disclosures into segment revenues and segment earnings, the results are mixed. While segment revenues have information content, segment earnings do not, suggesting the results are primarily driven by segment revenues. The results of rerunning with the 1987 data show that there is no difference between the various groups.

Further, the authors compared the surprise around the release of a firm's 1983 earnings with that surrounding the release of its1987 earnings. By 1987, all diversified firms had to comply with ASRB 1005 which mandated the disclosures of segment information. The results suggest that the sample of diversified non-disclosures group preceding mandatory requirements is far less predictable than the sample of diversified non-disclosures group after mandated disclosure. Also, the authors compared the sample of single segment group pre and post and found that the latter results are significantly more predictable than the earlier ones. However, the results used in the comparison may have been affected by the unknown structural change between the year 1983 and 1987.

Boatsman, Behn and Patz (1993: 46-64) examined whether equity valuations of U.S. multinationals are affected by geographical segment disclosures mandated by SFAS No.14. The sample selection included only firm-years in which one of the five geographical area codes for any foreign indicates Asia, Europe, Great Britain, South America, or Canada during 1985-1989. Geographical segment disclosures tests are conducted by employing the cumulative abnormal return as dependent variable during the 16 trading days beginning 10 days before the release of annual reports which contain geographical segment disclosures, with the deflated unexpected profits from any segment with geographical area operations in Asia, Europe, Great Britain, South America, or Canada, as independent variables.

The deflator is the market value of common equity as of one of trading day prior to the abnormal return accumulation period. The unexpected geographic segment earnings are measured as the annual change in earnings for that geographic segment, adjusted for exchange rate movements for the year unless it is not possible to identify the specific sources of geographic segments (e.g. the South America and

Asia region). The pooled time series and cross-sectional regressions results show that the coefficients of Asia, Europe, Great Britain, and Canada are significant. Otherwise, when excluding large values of deflated unexpected profit components (the absolute values exceed 0.25), the results show that the significance levels for Canada and South America stay approximately the same. The significant levels for Europe and Great Britain drop from being better than the 0.05 level to approximately the 0.10 level. The coefficients of Asia are the most sensitive because its significance drops from 0.024 to 0.877 when excluding large values.

These results imply that when unexpected segmental earnings are large, geographical segment disclosures are used, but there is little evidence to indicate that these disclosures affect equity values. More importantly, the association appears to be highly contextual, depending on the time periods examined, and regions selected. The authors examined two additional tests. The first test involved examining the regressions of cumulative abnormal return on unexpected geographical segment profits on a year-by-year basis using cross-sectional data. The second test involved testing the regression of 15-month return on unexpected geographical segment profit. Results of the two additional tests support the results.

Thomas (2000: 133-155) considered whether geographic segment earnings as reported under the requirements of SFAS No.14 provide value-relevant information beyond that provided by consolidated earnings. The author examined the geographic segment earnings coefficients by using two approaches. The first approach consisted of regressing unexpected security returns on unexpected geographic segment earnings. The second approach consisted of regressing leading period returns on current geographic segment earnings.

For the first approach, unexpected security returns is size-adjusted returns measured as a security's current raw return from April of year t to March of year $t+1$ minus the return for the corresponding size based portfolio. Size portfolio returns are calculated by dividing all firms into deciles based on their market value of equity at the beginning of year t. The unexpected geographic segment earnings are defined as changes in geographic segment earnings scaled by beginning price. The unexpected earnings from any segment with geographical area indicate operations in Asia, Europe, Great Britain, South America/Mexico, or Canada. In addition to these

five segments, a domestic segment and other foreign segments are included as repressors. To reduce the effects of cross-sectional correlation, yearly dummy variables are included in the models. The results show that all coefficients are positive with the exception of South America/Mexico, which were negative but insignificant from zero. The author only implies that the negative coefficient may be attributable to operating risk. Moreover, the F-test for equality of the seven geographic coefficients is significant. Although by excluding the South America/Mexico, the F-test for equality of other six geographic coefficients is significant. The author tested whether the particular unexpected geographic segment earnings provides any incremental information content in explaining security returns once unexpected total earnings is controlled for. The results of the regressions of unexpected returns on unexpected total earnings and individual unexpected geographic segment earnings show that unexpected earnings from the Domestic, United Kingdom, Europe, South America/Mexico, and Other Foreign segments provide incremental information in explaining security returns. These results thus imply that a significant difference in the valuation of unexpected earnings across geographic segments exists.

Based on the second approach, the author first regresses current returns on current geographic segment earnings to provide a benchmark for the longer return interval models, then investigate the relation between returns and geographic segment earnings with leading-period returns included in the model. The results reveal that for the one- or two-year leading-period returns models earnings coefficients are different across geographic segments, which suggest that such geographic segment disclosures weakly reflect the information in security prices, while by using the longer period (extending the return to three, four, or five years), evidence is found that significant differences exist across geographic segment earnings coefficients, which suggests that such disclosures reflect the information used in setting security prices and thus provide useful information.

The next section discusses the studies which consider the prediction effects of segmental information.

3.2.2.2 Studies of the Prediction Effects

The empirical evidence of the prediction effects is the study about the relationship between segmental data and earnings forecast accuracy. Empirical

research studies done by Kinney (1971: 127-136), Collins (1976: 163-177), and Silhan (1982: 255-262) employ time-series methodologies to determine whether segment information provides better predictions of a firm's future earnings ability. Likewise, Barefield and Comiskey (1975: 818-821) and Baldwin (1979: 376-389) employed analysts' forecasts to determine whether segment information improved these forecasts. The results provide some evidence to support the Fineness Theorem indicated previously in Chapter 2. Those studies can be grouped into (a) the predictive ability of earnings forecast models and (b) the actual decision makers as follows:

1) The Predictive Ability of Earnings Forecast Models

This type of study considers the predictive ability of forecast models to forecast accuracy. For example:

Kinney (1971: 127-136) considered the relative power of subentity earnings data for a sample of companies that voluntarily reported sales and earnings data by subentity. The sample consisted of 24 firms in 1968 and 19 firms in 1969, which voluntarily reported subentity earnings data in 1967. The author used four expectation models: (a) 1967 (and 1968) consolidated earnings multiplied by the predicted increase in gross national product, (b) an extension of the linear trend of consolidated earnings using double exponential smoothing, (c) the sum of predicted subentity sales multiplied by consolidated profit rates, and (d) the sum of predicted subentity earnings. The results show that segment-based prediction of the 1968 and 1969 consolidated profits have significantly smaller average absolute prediction errors than have prediction based on consolidated profit alone.

Collins (1976: 163-177) extended Kinney's (1971) study by examining a larger sample of firms, more forecast models, and predictions of both levels and first differences of consolidated earnings and sales. Collins employed 96 multisegment firms that did not disclose segment earnings information prior to 1970 on either published annual reports or reports filed with the SEC. Four years of segment revenues and profit information were taken from 1970 10-K reports (1967-70). Each of the nine forecasting procedures (seven consolidated models and two segmented models) was used to predict levels and first differences of sales and earnings before taxes and extraordinary items for each sample firm for 1968, 1969, and 1970. The seven consolidated models consisted of (a) the linear regression model,

(b) strict martingale, (c) submartingale, (d) pure mean revision-no drift, (e) moving average of a pure mean reverting process, (f) the double exponential smoothing model to predict levels and first differences of consolidated sales and earnings variables, and (g) the last year's consolidated earnings multiplied by the predicted increase in gross national product. The two segment-based models used were (a) the model of segment sales and consolidated profit margins, and (b) the model of segment sales and segment profit margins. Collins then calculated the mean absolute error, the difference between the mean absolute errors of each segment-based forecasting procedure and each consolidated-based forecasting procedure, as well as the averaged across the ninety-six sample firms. The results are consistent with those reported by Kinney. That is, forecasts of future earnings are more accurate for models based on segment revenue and income than for models based on consolidated data.

Silhan (1982: 255-262) provided a new approach to the predictive ability issue. Simulated mergers of existent, autonomous, single-product firms were used to provide evidence regarding the differences in predictive ability between income forecasts based on consolidated earnings and on segment earnings. Silhan employed 60 firms in the study which covered 44 consecutive quarters during the year 1967-1977. These firms that were chosen for the study that to have these criteria: (a) report on a calendar-year basis, (b) do not participate in regulated industries, (c) are not listed on a foreign exchange, (d) are domestically registered, (e) are not holding companies, (e) are not owned as subsidiaries, (f) have fewer than four three-digit SIC codes.

In addition, only firms of approximately the same size were merged to gather and control for possible confounds due to proportionality. Eligible firms were ranked by size in descending order to produce subgroups which were merged into segment portfolios. Firms are merged into groups of three, seven, five, and ten, to provide four sets of diversified firms. The final results consist of 20 three-segment, 12 five-segment, 8 seven-segment, and 6 ten-segment conglomerates. A Box-Jenkins analysis was selected to indicate both consolidated earnings models and segment earnings models. To assess the predictive ability of consolidated data and segment data, two metrics were used to measure performance: mean absolute relative error, and mean relative error. The signed absolute differences were then computed by

subtracting the absolute value of the segment earnings means from the absolute value of consolidated means. If the value of the signed absolute differences is positive, it indicates that segment earnings are superior to consolidated earnings. In contrast, a negative value indicates consolidated superiority. The results show that the mean absolute relative error comparisons are segment earnings superior, while the mean relative error comparisons are not. It implies that segment earnings may be of limited usefulness in making predictions.

Emmanuel and Pick (1980: 201-218) examined industrial segment sales and profit disclosure, together with industry sales projections published in various government and economic institutional sources to provide significantly more accurate estimates of future total-entity sales and earnings than those procedures that rely totally on consolidated data. The sample consisted of 39 firms that disclosed segment data for a minimum of three years for the year 1973-1977. The authors developed three segment-based sales prediction models and four segment-based prediction models to compare with the consolidated-based strict martingale model. The results of the differences between the segment-based forecast errors and the corresponding consolidated-based forecast errors reveal that all three segment-based forecasts of sales levels are more accurate (at the 99.9% significant level) than are the consolidated-based forecasts, while three out of four segment-based forecasts of earnings levels are more accurate (two at the 99.9% and one at the 95% significant levels) than are the consolidated-based forecasts.

Roberts (1989: 130-151) considered whether the geographical segment data disclosed by UK companies could be used to generate forecasts of earnings that outperform forecasts based upon past-consolidated data. This leads to the null hypothesis that the forecast error in one-year ahead of predictions of the attributable profits of U.K. multinational companies is the same whether the forecast is based upon consolidated data, segment geographical sales data or segment geographical earnings data. The sample used consisted of 78 U.K. companies based quoted industrial companies with overseas operations listed in the Times 1000 during the year 1981-1982. The author obtained the consolidated predicted models by using the random walk and submartingale process, while the segmental predicted models were generated for both geographical sales data combined with consolidated

attributable earnings to sales margin and segmental earnings data. The forecasts were based upon the forecasts of change in the GNP of individual countries, both with and without the addition of forecasted inflation rates. The results suggest that models based upon both geographical segment sales and segment earnings outperform the random walk and random walk plus drift consolidated models for the years 1981 to 1983. The differences in the sizes of the errors between the segment data based and consolidated data based models were significant in the majority of cases.

Balakrishnan, Harris and Sen (1990: 305-325) considered whether geographically segmented data (sales and income) provide incremental information about the earnings process. They evaluated the specific contribution of sales and income geographically segmented data by estimating their predictive ability. The sample consisted of 89 companies identified for 1979 to 1983. Two sets of geographically segmented predictions were used in the predictive accuracy tests. The first set of predictions assumes perfect foresight and uses the realized values of the macroeconomic variables. The second set of tests relaxes the perfect foresight assumption and uses various forecasts of the exchange rate and growth variables. To compare predictive ability, the authors compared the relative absolute error of the predicted value, calculated the mean absolute value error, and estimated the difference in the mean absolute value error for the relevant geographically segmented and consolidated model. The results of assuming perfect foresight reveal that for income, both the random walk model and the growth model show increases in predictive accuracy from using of geographically segmented data. The results for sales are not as consistent, because the random walk model shows that the geographically segmented forecast is worse than the consolidated forecast, while the growth model favors geographically segmented data. In contrast with the results using the forecasts of exchange rates and the growth variable, the findings show no significant differences exists in the predictive ability of the segment and consolidated forecast models. The latter insignificant results may be attributed to the inaccuracy in annual forecasts of country-specific growth and exchange rates.

Ahadiat (1993: 357-371) investigated the usefulness of FASB segment reporting requirements concerning geographic areas of operations. The author tested whether predictions of future earnings based on consolidated earnings

are at least as accurate as those predictions made with the use of earnings reported by the enterprise's geographic segments. A time series methodology was employed for the analysis. Forecasting models are developed for both segmental and consolidated income series. To evaluate the predictive ability of geographically segmented vis-à-vis consolidated financial information, the earnings predictions of each firm are compared with the actual results. The sample consisted of thirty-three firms by using the year 1977 as the first fiscal year in which many multinational companies included geographic-segment information in their financial statements, and considering the annual reports and the SEC Form 10-K of previous years as far back as 1969. Only firms that did not significantly change their reporting practice with the adoption of SFAS No.14 were included in the sample to reduce the effects of uncontrollable variables. Ahadiat also evaluated the accuracy of forecasts in relation with the number of reporting segments by classifying the sample into two groups. The first one is firms that disclose their annual income by only two geographic areas of operations, namely, domestic (United States) and foreign. Another group is firms that disclose their annual income by more than two geographic areas of operations. With the two geographic classifications, the results show that the predictive ability of geographic earnings is 94% better than that of consolidated data, whereas the results with more than two geographic classifications show that all segmental models outperformed the consolidated results. However, when Ahadiat used the original segmental models and the modified models which combined all foreign segments into one Non-U.S. segment, the findings revealed that in eleven out of fifteen cases, the original segmental models provided a better forecast of future earnings than the models using modified data. Only in four cases did the modified data out perform the original results. The computed t-statistic is not statistically significant to reject the null hypothesis that the predictions of the enterprise's future earnings from information classified on the basis of only two geographic areas of operations (U.S. and non-U.S.) are at least as accurate as those predictions based on information reported for more than two geographical areas of operations. These results can be used to conclude that although the consolidated income series provides a reasonable adequate forecast of income, geographically segmented earnings improve the accuracy of the prediction.

Further, the results suggest that the predictive ability of foreign earnings slightly improves with more data disaggregation.

Nichols, Tunnell and Waldrup (1996: 125-136) examined whether model-based earnings forecasts utilizing COMPUSTAT's country specific geographic segment data produced more accurate earnings forecasts than model-based forecasts utilizing data from actual geographic segment footnotes. The COMPUSTAT business segment database simply duplicated the diverse geographic and line of business segment data that is reported in financial statements per SFAS 14. They compared the accuracy of earnings and sales forecasts from models using the information in actual geographic segment footnotes to the accuracy of earnings forecasts from similar models that instead used the enhanced geographic segment information in the COMPUSTAT business segment tape. The authors employed 54 firms during the period 1986-1987 as the sample. The results show that the geographic segment data provided in the COMPUSTAT business segment database appears to make it possible to more accurately predict sales than does the geographic segment data provided in the same companies' actual geographic segment footnotes.

Lobo, Kwon and Ndubizu (1998: 969-985) considered the impact of segment disclosures provided under SFAS No.14 on security prices and security analysts' earnings forecasts. They set out two hypotheses related to SFAS No.14 segment disclosures. The first is that these disclosures convey additional information that is relevant for pricing firms' shares of stock. The second hypothesis is that the additional information provided by SFAS No.14 disclosures would enhance financial analysts' forecasting ability, thereby resulting in more accurate earnings forecasts. They conducted the empirical analysis on a sample of 76 firms that disclosed segment information in their fiscal year 1977 annual reports. They used a matched-pairs design to compare price-variability and analysts' earnings forecast accuracy in the periods prior to and following the availability of SFAS No.14 segments disclosures. The results show that mean price variability significantly exceeded its expected value of one on days, -2, 0, and +1 during 1977, the year SFAS No.14 segment data was enacted. It is greater than its corresponding value in the predisclosure year 1975, on every day except day +2. The parametric z-test statistics indicate significantly ($p<0.01$) greater price variability in1977than in 1975 on days 0 and +1. Using the

Wilcoxon test, price variability is significantly greater on day +1. When comparing price variability between 1977 and 1976 it is generally consistent with those in between 1977 and 1975, with mean price variability during release of the 1977 annual reports exceeds its expected value on days –2,0 and +1. The z-test shows that price variability on day –2, +1, +2 in 1977 is significantly greater than in 1976. The Wilcoxon test results are consistent with those of the z-test. These results provide some evidence of increased price variability at the time of disclosure of SFAS No.14. Further, when comparing the cumulative price variability statistics of periods (-2, +2), (-2, +1) and (-1, +1) between the year 1977 and 1975, and between 1977 and 1976. The results show that cumulative price variability is significantly greater at the time of release of SFAS No.14 segment information in 1977 than it is in 1975 and 1976. Hence, there is a significant increase in stock price variability at the time of first disclosure of annual reports containing SFAS No.14 segment data. These disclosures provide value relevant information to market participants. Moreover, the results show that segment data disclosed under SFAS No.14 enhances financial analysts' ability to forecast earnings.

To enhance the validity of the results, they repeated the forecast accuracy analysis on a sample of single-segment control firms that were matched with the multi-segment experimental firms on the basis of firm size. The results show that forecast accuracy improved from 1976 to 1978 for the control firms, but the forecast accuracy increase for the experimental sample is significantly greater than the improvement in forecast accuracy over these same periods for a matched sample of firms that did not disclose such information. Therefore, SFAS No.14 segment information significantly improved security analysts' earnings forecasting ability. Based upon these results, SFAS No.14 segment disclosures convey incremental information over previously reported SEC line-of-business information that is relevant to stockholders and to security analysts.

Behn, Nichols and Street (2002: 31-44) examined the usefulness of SFAS No.131 geographic segment disclosures by comparing the predictive ability of geographic disclosures under SFAS No.131 to the predictive ability of SFAS No.14 geographic disclosures. Forecast error for models employing SFAS No.131 geographic data were compared to forecast errors for model employing SFAS No.14

geographic data. To compare the predictive ability, sales and income expectations must first be developed from data provided by SFAS No.14, SFAS No.131 and consolidated information by using three models: (a) perfect foresight exchange rates (i.e., actual exchange rate) with no adjustment for expected growth, (b) perfect foresight exchange rates and perfect foresight growth in relative dollar nominal gross domestic product (NGDP), (c) forecasted exchange rates and forecasted growth in NGDP. The sample consisted of 578 observations, including 289 SFAS No.131 and 289 SFAS No.14 observations. The results show that there is a significant improvement in the predictive accuracy of geographic sales disclosures provide under SFAS No.131, compared to SFAS No.14 for all three models. However, there is limited support for the forecast accuracy of geographic income. Using the perfect foresight exchange rates yields a mean difference of a 4.95 percent increase in the SFAS No.131 model over the SFAS No.14 model at the marginally significant $p < 0.10$. The perfect foresight exchange rates and growth is not significant, while the forecasted exchange rates and forecasted growth in NGDP shows a mean difference of a 4.75 percent increase in the SFAS No.131 model over the SFAS No.14 model at the marginally significant $p < 0.10$.

Ettredge, Kwon, Smith and Zarowin (2005: 773-804) examined the effect of firms' adoption of SFAS No.131 segment disclosure rules on the stock market's ability to predict the firms' earnings, as captured by the forward earnings response coefficient (FERC). The FERC is the association between current-year returns and next year earnings. The sample consisted of 6,827 firms, with 21,698 firm-year observations. The data from these firms were collected in the three-year periods both before and after adoption of SFAS No.131. The pre-period is December 1995 – November 1998 and the post period is December 1999- November 2002. The authors estimated that the regression between current returns and future earnings for a sample of firms were likely affected by SFAS No.131, for a pre-period and a post period. They defined firms that disclosed multiple segments in any of these years as likely affected by SFAS No.131. To ensure that any changes in the returns-earnings for these firms are due to SFAS No.131, they also estimated the same regressions for a control sample that were likely unaffected by SFAS No.131. The control sample consisted of firms disclosing single segments in every year of the pre-post periods for

which observations are available. For each group, the coefficients on the future earnings between the pre and post periods are compared. The results show that firms likely affected by SFAS No.131 have a positive and significant increase in FERC, while firms likely not affected by SFAS No.131 have no change in FERC. Such FERC increases are likely the result of qualitative improvements in their segment disclosures.

In addition to the studies done on the predictive ability of prediction model, next section presents another aspect of predictive ability, i.e. the predictive ability of actual decision makers.

2) The Predictive Ability of Actual Decision Makers

Under this aspect, the study will use analyst's forecasts to address the issue whether humans may be able to use segmental information to improve their forecasts. Details shall be represented as follows:-

Barefield and Comiskey (1975: 818-821) examined the correlation between the rankings of forecast accuracy and quality of disclosure. They used the data from the Standard and Poor's Earnings Forecaster to calculate and measure the forecasting performance, while the quality of disclosure designed to reflect the quality of firms' voluntary disclosure of segmental data (pre-1970) was based on the study of Kachanek (1974). Kochanek (1974: 245-258) developed a quality ranking reflective of the varying degree of fineness by classifying each firm as either a good or poor reporter of segmental data (the good reporters consist of firms that disclose, at least the minimal desired amount of sub-entity details, complete segment descriptions and corresponding gross revenues). The results show that there is a positive significant correlation between the forecast accuracy and quality of disclosure.

Baldwin (1979: 376-389) considered whether users of financial statements were able to predict earnings per share better after implementation of the SEC's line-of-business disclosure requirements in 1969-1970. The null hypothesis is used in the following manner: security analyst forecast accuracy is no different after required segment earnings disclosure (1972-1973) than it is before such a requirement (1969-1970). Because segmented SEC Form 10-K statements first became available in the spring of 1971, it is unclear which forecasts released during that general time period would have been based on segmented data and which on consolidated data,

thereby excluding the forecasting made during 1971. Analyst forecast accuracy, the absolute percentage error, was evaluated before and after implementation of the SEC's line-of-business disclosure requirements that became effective in 1971. Analyst forecast was implemented by using forecast of earnings per share reported in the Value Line Investment Survey. The sample consisted of 188 firms which were classified into three groups: (a) multi-segment firms that first reported segment earnings in 1971; (b) multi-segment firms that had voluntarily disclosed segment earnings data prior to 1971; and (c) a group of single-segment firms that continued to report only on a consolidated basis. Based on the null hypothesis, the company whose earnings are being forecasted is the subject and is observed before and after implementation of the SEC segment disclosure requirements by using a multivariate repeated measures the analysis of variance (ANOVA) model. The results show that while an overall decrease in forecast error is observed for all groups, the most significant change is for multi-segment firms without prior segment disclosures. Baldwin concluded that for multi-segment firms, security analysts were able to make more accurate earnings projections after segment reporting was adopted in 1970.

In summary, many researchers in other countries have investigated the segment reporting practices and the usefulness of segmental disclosures, but this has not been the case in Thailand. This study is thus needed to investigate how listed companies disclose the segment information and whether the usefulness of segment information from the perspective that segment data provides incremental information beyond that contained in the firm level data, and that future performance is more strongly associated with segment data than with aggregated information. In general, the study on segment reporting in practice always focuses on the descriptive approach, while the research study on the usefulness of segment information concentrates on hypotheses testing.

CHAPTER 4

HYPOTHESES DEVELOPMENT AND RESEARCH DESIGN

The main objective of this study is to examine segment reporting in practice and the quality of segment information of listed companies in Thailand. Two main accounting standards affect the segment reporting practices. The first is TAS No.24, which was officially promulgated in 1994. The other is TAS No.50, which was unofficially pronounced as one accounting standard but issued in 2000.

To provide a better understanding of the evaluation of accounting standards, a time continuum which summarizes the critical events in the development of segment reporting in Thailand is presented in Figure 4.1.

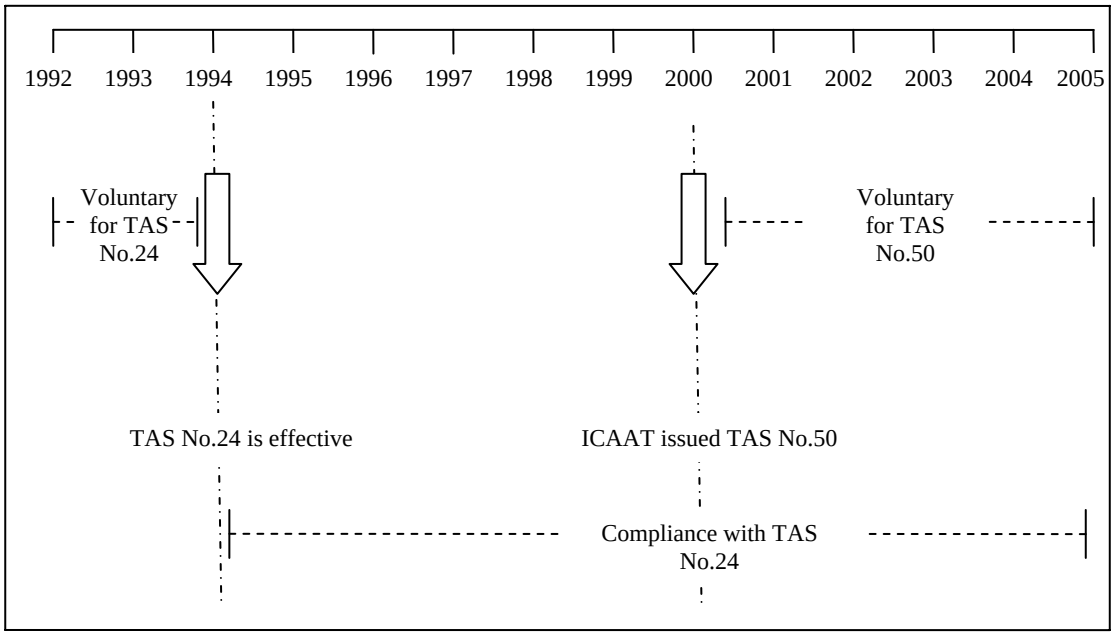

Figure 4.1 Time Continuum of Critical Event in the Development of Segment Reporting in Thailand

Using Figure 4.1 as a guideline, the scope of this study was outlined and each research question in Chapter 1 determined as follows.

This study focuses on segment reporting in practice of Thai listed companies by using data from 1992-2005. The extent of compliance with the existing segment reporting standard is based on the reason that unless companies comply with segment reporting requirements, segment disclosures will not benefit users to their maximum potential. This study also investigates whether segmental disclosures of listed companies contained in the notes of financial statements are consistent with that in other parts in the annual reports. The sample uses data from 2005, when TAS No.24 based on IAS No.14 was still effective. These factors are consistent with the following research questions.

Q1: How do listed companies disclose their segmental information?

Q2: Are segmental disclosures of listed companies in the notes of financial statements consistent with those in other parts of annual reports in 2005?

In addition to the perspective of preparers, this study provides information from the perspective of users by using the data in 1994-2005. Of course, if segment reporting provides useful segmental information to investors, the segment data provides incremental information beyond that contained in the firm-level data. Further, an advantage of disclosing information about segments is that it can provide useful information that enables users to make a better assessment of future prospects for the enterprise, i.e. segment data is more associated with future performance than with firm-level data. These statements are consistent with the following research questions.

Q3: Does segment data provide incremental information beyond that contained in the firm level data?

Q4: Is future performance more strongly associated with segment reporting information than with aggregated information?

Based on each research question, this chapter will develop research hypotheses and discuss the research design including the data source, the sample selection, and the research methodology. Details regarding the research questions are discussed below.

4.1 How do Listed Companies Disclose their Segmental Information?

This study considers how the listed companies have disclosed segmental information in practice with respect to the time intervals shown in Figure 4.1, i.e. (a) before TAS No.24 became effective – the period 1992-1993, (b) the period when TAS No.24 was pronounced to be an accounting standard - during the year 1994-1999, and (c) the period when TAS No.50 was pronounced to substitute TAS No.24 – during the period 2000–2005.

Firstly, during the period 1992-1993, there was no reporting standard that called for segmental disclosures before TAS No.24. In fact, the disclosure of information has a direct monetary cost, in particular, the value of the resources used in gathering and processing the information and in its audit and communication. The voluntary disclosures will also place individual companies at a competitive disadvantage. However, the disclosures may provide some advantages, because the voluntary segment disclosures may reduce information asymmetry and help investors to assess the return on their investment or evaluate management decisions. If such disclosures can increase the credibility and the public image of the company to the capital market, it thereby yields a positive effect on share prices. For this reason, this study investigates whether listed companies voluntarily disclosed segmental information during 1992-1993.

Secondly, during the period 1994-1999, TAS No.24 was promulgated by the ICAAT to provide guidelines for managers on how to make accounting decisions, as well as provide outside investors with a means of interpreting these decisions. Certainly, under TAS No.24, public enterprises are required to report about significant industry segments and geographic segments in which they operate. However, the identification of segments is the responsibility of management. They are expected to exercise their judgment in determining how the enterprise activities are to be grouped for reporting as segments. More importantly, although disclosing information about segments can provide useful information that enable users to make a better assessment of the past performance and future prospects of the enterprise, such disclosures may weaken an enterprise’s competitive position because more detailed information is made available to competitors, customers, suppliers, and others. Because the

management is likely to withhold certain segment information or to utilize broad, vague segment groupings. This study is needed to examine how listed companies disclosed segmental information during 1994-1999. Indeed, TAS No.24 requires that the listed companies disclose segment revenue, operating profit, and segment assets. To observe how well listed companies comply with TAS No.24, this study will consider the nature of segmental disclosures on (a) how the listed companies identify their segments, and (b) what types of accounting information are provided in segment reports.

Finally, during the period 2000-2005, although TAS No.50 had been delayed to be formally pronounce as an accounting standard, TAS No.50 was adopted early by firms. It seems to be an option for Thai listed companies to choose either TAS No.24 or TAS No.50 when disclosing segment information. The differences in both accounting standards are that TAS No.50 provides much more information than that of TAS No.24. Of course, TAS No.50 requires listed companies to disclose segment liabilities, capital expenditures, depreciation, non-cash expenses other than depreciation, and equity method income in addition to segment revenues, segment results, and segment assets. Moreover, TAS No.50 is applied by using the financial analysis notion of assessing enterprise risks and rewards approach for the classification of business and geographic segments. The basis for identifying the predominant source and nature of risks and the differing rates of return is also dependent on an enterprise's internal organizational and management structure and its system of internal financial reporting. Information about those segments may already be generated for management's use, so the incremental cost of providing this information could be relatively low. Consistent with the suggestion of prior literature (i.e. Emmanuel and Garrod, 1987: 239; Albrecht and Chipalkatti, 1998: 49), the adoption of the management structure may ensure that preparers do not incur additional costs of processing the data, because organizations already prepare financial reports for resource allocation and performance evaluation. On the contrary, disclosing segment information based on TAS No.50 may open a large window into a business' inner workings by allowing outsiders access to more information, so management faces an increased competitive risk as a result of competitors knowing more about the company. Most companies guard information on the profitability of

segments carefully, because if too much information is revealed in financial statements, the companies could lose their negotiating advantage in an acquisition. Consequently, an opportunity is given to examine how listed companies choose to disclose segment information during the period 2000-2005.

Overall, the examination of the nature of segmental disclosures in the first question is descriptive rather than based on any hypothesis testing. Hence, details regarding the data source, the sample selection, and the methodology will be discussed below.

4.1.1 Data Sources and Sample Selection

The firms are the listed companies in the Stock Exchange of Thailand that were listed during 1992-2005. The financial statement information, in particular notes of financial statement, is mostly extracted from the I-SIMS CDs, Listed Company Info CDs issued by the SET, and http://www.sec.or.th. The I-SIMS CDs provided financial data from the year 1994[6] to the year 1998; Listed Company Info CDs provided the financial data from the year 1998 to the year 2002; and the website http://www.sec.or.th provided the financial statements for the year 2003-2005.[7]

However, the notes of financial statements of listed companies during 1992-1993 could not be obtained from any of the sources as mentioned above. To make this study complete, I requested some annual reports or financial statements directly from the listed companies by sending them letters or by employing the telephone to request the annual reports or financial statements. While this study tries to find the annual reports in the library of universities, especially in the library of Chiang Mai University, of Chulalongkorn University, and of Thammasart University.

The sample excludes the listed companies in the financial institution industry, because those firm operations are unique and they are subject to specific rules and regulation. Consequently, the number of listed companies included in this study consists of 4,199 firms-year observations.

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[6] Some notes of financial statements during the year 1994 are unavailable in the I-SIMS CDs, this study also requested them from the listed companies themselves or from the library of universities.

[7] The names of the data sources are different, but the data are of the same type, because the data come from original financial statements submitted to the SET and SEC by listed companies.

Table 4.1 Numbers of Firms Included in this Study

Year	The number of listed companies (a)	Firms in Financial Institution Industry (b)	Listed companies excluding the financial institution sectors (c) = (a) –(b)	Data are not available[1] (d)	Total listed companies (Final Sample Size) (e) = (c)-(d)	Companies with year ends other than December (f)	Companies with year ends December (g) = (e) –(f)
1992	305	68	237	118	119	3	116
1993	347	75	272	136	136	7	129
1994	389	78	311	79	232	15	217
1995	416	83	333	10	323	22	301
1996	454	91	363	11	352	24	328
1997	431	66	365	17	348	22	326
1998	418	63	355	15	340	22	318
1999	392	57	335	10	325	20	305
2000	381	57	324	10	314	19	295
2001	382	59	323	14	309	18	291
2002	389	62	327	18	309	17	292
2003	408	64	344	6	338	18	320
2004	440	65	375	12	363	20	343
2005	468	68	400	9	391	20	371
Totals	**5,620**	**956**	**4,664**	**465**	**4,199**	**247**	**3,952**

Note: 1 Data are not available includes firms having a few transactions in notes of financial statements (e.g. firms have a few transactions which do not end with others, commitments and contingent liabilities, or reclassification of transaction). The data may be absent because of the incomplete scanning process.

Of the 4,199 firms-year observations, this study divides the sample into two groups: (a) group 1, the sample companies with calendar year-ending (December 31st), and (b) group 2, the sample companies with a non-calendar year-end; because TAS No.24 became effective for fiscal years beginning on or after January 1st, 1994. The sample companies with a non-calendar year-end did not need to comply with TAS No.24 in 1994. The sample of companies with a non-calendar year-end and with calendar year-end are represented in the last two columns of Table 4.1.

4.1.2 Research Methodology

This section focuses on the question of how the listed companies disclose segmental information in Thai capital market based on the data from the period 1992-2005. The examination of this study can be classified into three time periods: (a) the years 1992-1993, (b) the years 1994-1999, and (c) the years 2000-2005. This section firstly provides information about the procedure that was used to collect the data in years 1994-2005 in order to get the criteria about the nature of segment information, because the period 1994-2005, unlike the years 1992-1993, contained data that incorporated an accounting standard as guidance.

This section initially explains the procedure for collecting the sample in 1994-1999 and then goes on to specify such procedure used on data collected during 2000-2005 to determine how many firms voluntarily disclosed segment information, and finally explains the procedure used in collecting the sample data during 1992-1993.

The research methodology for examining segment reporting in practice initiates with the survey listed companies in the Thai capital market by using the following scope.

Firstly, this study uses only information included within the financial statements and footnotes that are clearly subject to the TAS No.24 guidelines and are audited. In general, firms report segment information either under the topic of “a summary of significant accounting policy”, a topic of “segment information”, a topic of “disclosure of sectoral operation”, a topic of “data by division”, or under topics that have similar meanings in the notes of their financial statements.

This study classifies firms reporting segment information as a topic in the notes of their financial statements into the group of “segmental disclosures”. In contrast, if firms do not report segment information as a topic in the notes of their financial statements, this study refers to such firms as the “do not disclose any segmental information” group.

Secondly, to consider how the listed companies identified their segments, the “segmental disclosure” group is divided into two subgroups: (a) multi-segment firms, and (b) single segment firms.

The “multi-segment firms” group consists of firms that report their operations as having more than one segment (e.g. industry segments, geographical segments, or both industry and geographical segments) and must disclose their associated financial information (such as sales, segment result, or segment assets employed). Based on the yearly data for the multi-segmental disclosure group, this study divides those firms into the nature of identifying segments: (a) industry/line-of-business format, (b) geographical format, and (c) both industry and geographic format.

In contrast, the “single segment firms” group consists of firms that revealed their operations as having only one segment. Although their operations cannot be classified into different segments, they have still revealed information about their operations rather than not disclosing any segment information in the footnotes of their financial statements.

The examples of single segment firms are as follows.

- A company's operations consist of manufacturing Product A and Product B. Management considers this as an integrated and complementary line of products. For this reason, management determines that the company has only one industry segment. Moreover, in terms of operating locations and market areas, the management also determines that the company has only one geographical segment since it operates solely in Thailand;
- The parent company and its subsidiary companies operations involve a single industry segment referred to as Business X which is carried out solely in Thailand. As a result, all the revenues, operating profits and assets are reflected in these financial statements that pertain to the aforementioned industry segment and to one geographic area;
- The company operates only Business Y; therefore, there is no presentation of financial information by segment;
- etc.

Thirdly, this study classifies the sample of “multi-segment firms” groups based on industry sectors specified by SET to determine the distribution of the sample.

Finally, under TAS No.24, the extent of segmental disclosures requires that firms disclose three main accounting transactions for each reported industry and geographical segment: (a) sales/revenues, (b) segment results, and (c) segment assets.

This study also considers how well listed companies comply with segment reporting requirements based on those three main accounting transactions reported in each line-of-business and/or geographic segment. In the case of disclosing segmental information beyond these scopes, such as liabilities, cash flow, and etc., this study refers to such disclosures as the voluntary segment disclosures.

However, in the period 2000-2005, the firms had an option to apply segment reporting based on TAS No.24 or to voluntarily provide information based on TAS No.50. This study is thus needed to consider whether firms voluntarily disclosed any segmental information according to TAS No.50 during the years 2000-2005 based on the following criteria in Figure 4.2.

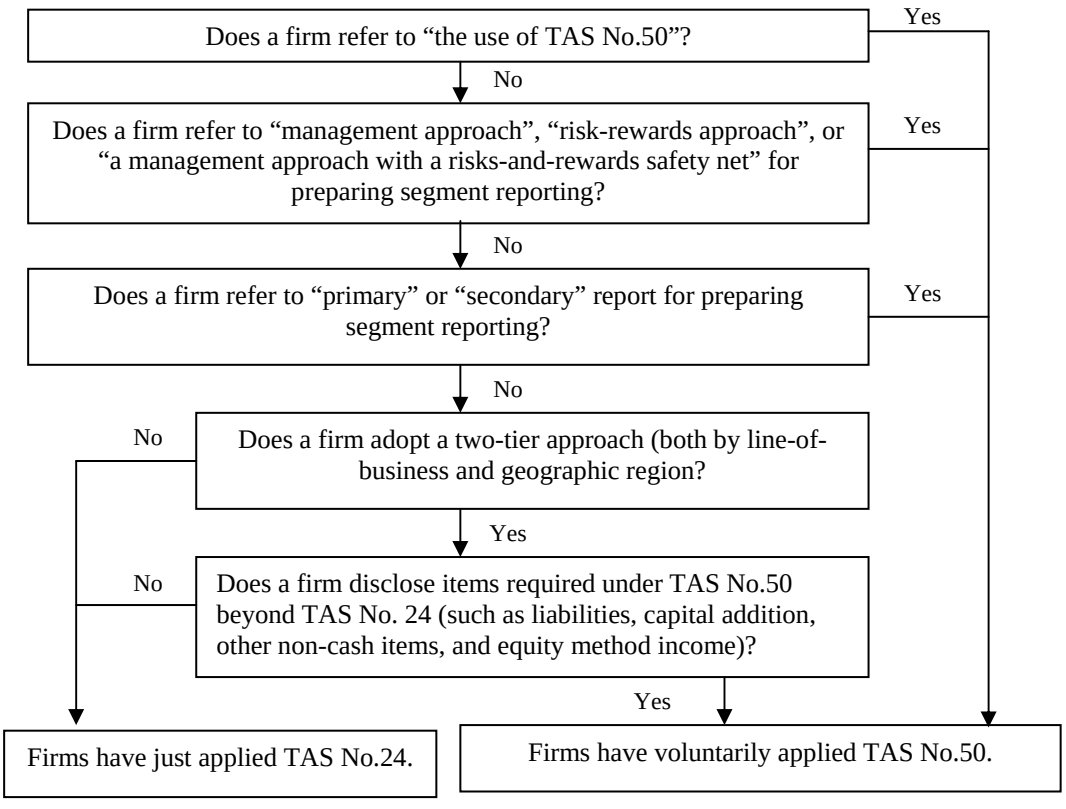

Figure 4.2 The Classification Criteria for Considering Which Firms Have Voluntarily Reported Information Based on TAS No.50

Based on Figure 4.2, if a firm uses TAS No.50, based on either the management approach, “risk-rewards approach”, “a management approach with a risks-and-

rewards safety net, or primary report/secondary report for preparing segment reporting, this study classifies such firm into the group of voluntary using TAS No.50. If the firm does not, this study examines whether the firm adopts a two-tier approach.

Of course, when considering the sample obtained from the SET, this study finds that some firms present both industry segments and geographical segments, and some present them as a matrix presentation. While TAS No.50 does not require a matrix presentation – both business segments and geographical segments as primary segment reporting formats with full segment disclosures on each basis, it does not prohibit such presentation.

Consequently, this study further examines whether firms have disclosed their accounting transactions beyond the extent to which TAS No.24 required them but in accordance with those conditions of TAS No.50, such as liabilities, cost of acquire property, plant, and equipment, depreciation and amortization expense, other non-cash items, and equity method income as an additional criteria. To see the differences between TAS No.24 and TAS No.50, this study uses the criteria shown in Table 4.2, for considering whether firms voluntarily applied TAS No.50 with their financial statements.

Table 4.2 Comparison between the Scope of Segmental Disclosures of TAS No.24 and of TAS No.50

TAS No.24	**TAS No.50**
Items Required under Both TAS No.24 and TAS No.50	
(a) Sales or other operating revenues - From customers outside the enterprise - From other segments	(a) Sales or other operating revenues - From customers outside the enterprise - From other segments
(b) Segment results	(b) Segment results
(c) Segment assets employed	(c) Segment assets employed
Items Required only Under TAS No.50	
	(d) Segments liabilities
	(e) Cost of acquire property, plant, equipment, and intangibles
	(f) Depreciation and amortization expense
	(g) Other non-cash expense
	(h) Equity method Income

This study also considers whether firms have voluntarily disclosed segment information in the period 1992-1993. It is quite difficult to judge whether firms have voluntarily disclosed segment information in those periods, because there is no criteria (i.e. accounting standard about segment reporting) to exactly identify their motive. Thus, this study uses the general guideline consistent with TAS No.24, such as different type of location or of business. For instance, if a firm releases information in the notes of their financial statement or statement of income that state sales consist of sales in Thailand and sales in foreign countries, consistent with the guideline of TAS No.24, this study classifies such firm into the group of voluntary segment disclosures.

Likewise, if a firm discloses information in the notes of its financial statements or statement of income that state that sales consist of sales of cement and sales of paper, according to the general guideline of TAS No 24, this study classifies such a firm into the group of voluntary segment disclosures.

In summary, to provide a better picture of research methodology used to answer the first research question, this study summarizes the procedures used in Table 4.3.

Table 4.3 Summary the Procedure for Considering the Nature of Segmental Disclosures

Procedures	**1992-1993**	**1994-2000**	**2000-2003**
1. Survey listed companies in Thai capital market	x	x	x
2. Classify firms as "segmental disclosure" group, or "do not disclose any segmental information" [1]	x[2]	x	x
3. Classify "segmental disclosure" group into two subgroups. (a) multi-segment firms[3]; and (b) single segment firms[4]	x	x	x
4. Report the segment reporting practices on (a) how the listed companies identify their segments; and (b) what types of accounting information provided in segment reports	x	x	x
5. Specific how many firms have voluntarily reported information based on TAS No.50 by using Figure 4.2.			x

Table 4.3 (Continued)

Notes: 1 Firm reports segment information in a topic of "a summary of significant accounting policy", a topic of "segment information", a topic of "disclosure of sectoral operation", a topic of "data by division", or a topic that have similar meanings in the note of statement. This study classifies such firm as "segmental disclosure" group. In contrast, if firm does not report segment information as a topic in the note of statement, this study refers such firms to "do not disclose any segmental information" group.

2 Based on the general guidance of TAS No.24.

3 The "multi-segment firms" group consists of firms that report their operations having more than one segment (e.g. industry segments, geographical segments, or both industry and geographical segments) and have to disclose financial information (such as sales, segment result, or segment assets employed).

4 The "single segment firms" group consists of firms that reveal their operations having only one segment.

4.2 Are Segmental Disclosures of Listed Companies in the Notes of Financial Statements Consistent with Those in Other Parts of the Annual Reports in 2005?

The second research question is concerned with the consistency of segmental disclosures which is explored by considering whether segmental disclosures of listed companies in the notes of financial statements are consistent with those in other parts of the annual reports. To focus on the consistency of segment reports seems to be feasible and a useful aim, because Emmanuel and Garrod (1987: 236-238) revealed that users prefer more detailed break-downs of the business and geographic segments with more financial data but a general concern appears to relate to the consistency of the segmental disclosures with other data provided in the annual accounts and reports. According to the study of Emmanuel and Gray (1977: 38-39), the significant aspects of the company's organization in response to its effective product/market environment

are often apparent from other parts of the company report that allow the investors to understand the nature of the business to the operations. Thus, the inconsistency between segmental disclosures in notes of financial statements and supplementary disclosures may make readers/users confused about the firm's activities. The question whether segmental disclosures in the notes of financial statements are consistent with how companies see their reported data in other parts of the annual reports, such as (a) introductory annual report material and (b) the management discussion and analysis, sheds light on the quality of disclosures provided.

In this regard, the examination of the consistency of segmental disclosures in the second question is also descriptive rather than based on any hypothesis testing. Details regarding the data source, the sample selection, and the methodology will be discussed below.

4.2.1 Data Sources and Sample Selection

Based on the sample selection of the first research question, the sample employed in the second research question is only for the year 2005 in order to examine the consistency of segment information between in the notes of financial statement and in other parts of the annual reports. The disclosure of main operations by firms in other parts of the annual reports is generally quite consistent for each year. The year 2005 is the latest sample year, so it is a good indicator of future practice. The 349 annual reports of 2005 are also quite complete and available from the SET Library and the http://www.sec.or.th.

4.2.2 Research Methodology

The current research addresses whether the segmental disclosures contained in the notes of financial statements of listed companies are consistent with those in other parts of their annual reports. According to the initial study done by Emmanuel and Gray (1977: 38-39), the benchmark considered useful here is that presented by supplementary information about the company's activities and organization structure which is usually given in other parts of company report, such as (a) introductory annual report materials, and (b) management discussion and analysis. The introductory annual report material considered in this study includes two parts: (a)

revenue structure of the listed companies, and (b) items other than the management discussion and analysis, revenue structure, and audited statements, e.g. the shareholder's letter, the description of nature business, operations review, etc.

This led to the review of each set of 349 annual reports. The analysis considered only information included within the financial statements and footnotes of audited reports. It was considered whether such disclosures in the notes of financial statement were consistent with how the company saw itself reporting in other parts of the annual report with regard to segmental disclosures.

The research methodology based on the types of segmental disclosures was split into two categories and will be discussed in this section. The two categories are: (a) multiple classes of segment disclosures, and (b) single class of segment disclosures.

4.2.2.1 Analysis of Multiple Classes of Segment Disclosures

Under multiple classes of segment disclosures, the criteria of classifying firm as consistent or inconsistent will be analyzed in the following manner, as indicated as Figure 4.3.

Based on Figure 4.3, the term of "consistency" refers to companies where the introductory annual report information and/or management discussion segment information agrees with the segment information contained in the notes of financial statements (consistent with the types of segmental disclosures and the number of segments). For example, the firm provides geographic segment information in both the notes of financial statement and in the other parts of the annual report, more importantly, the number of lines in the segment footnotes is equal to that in the other parts of the annual report.

In assessing such data, a certain amount of interpretation has been unavoidable. Hence, the sense, "the number of segment is equal" should give the sense of "similar meaning of each segment". However, if a firm provides the introductory annual report information and/or management discussion segment information which agrees with the segment information contained in the notes of financial statement (consistent with the types of segmental disclosure but different in the number of segment items indicating more or less segments than reflected in the

segment footnote), then this situation is called “consistency (same classification but difference in the number of segments)”.

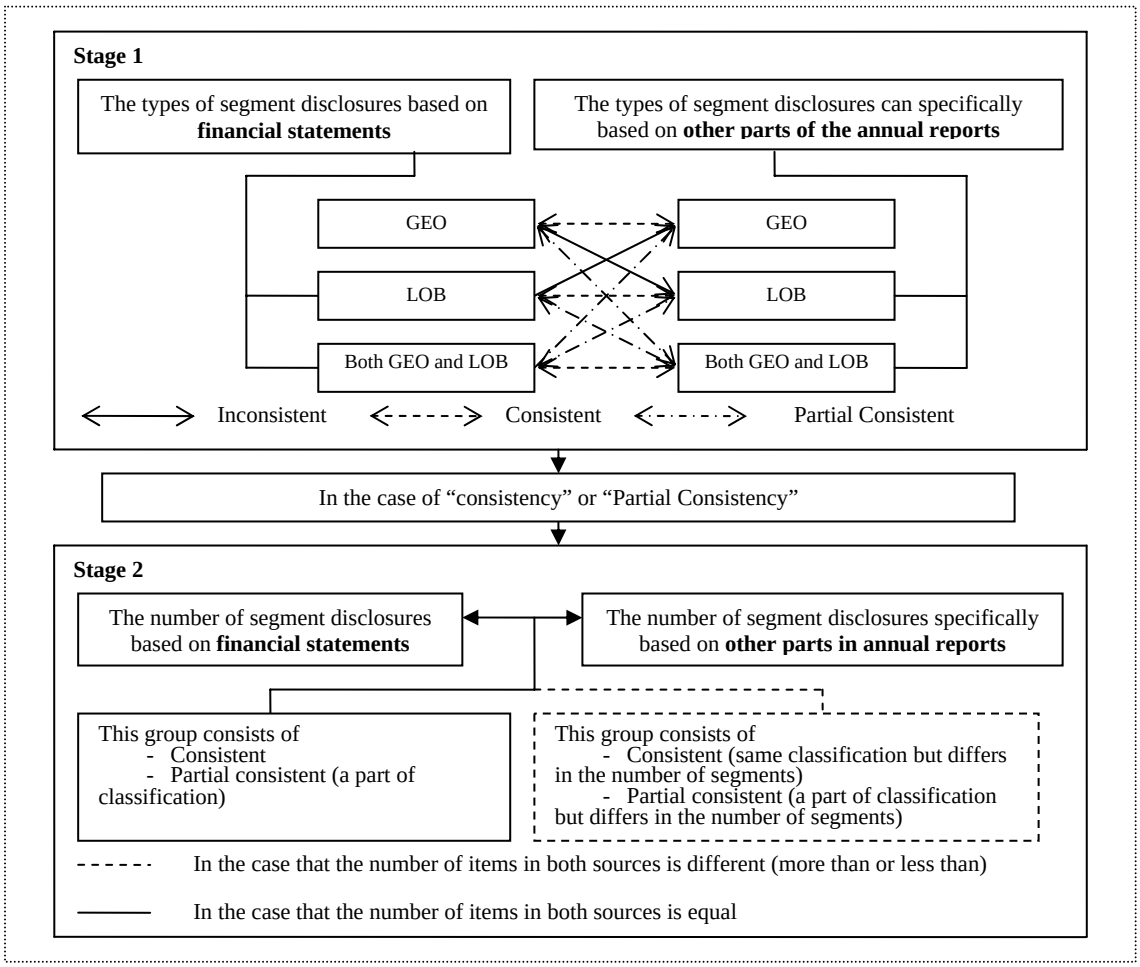

Figure 4.3 The Procedure of Considering the Consistency Analysis of Multiple Classes of Segment Disclosures with the Other Parts of Annual Reports in 2005

In contrast, the term of “inconsistency” refers to companies where the introductory annual report information and/or management discussion segment information does not agree with the segment information in the notes of financial statements (not consistent with the types of segmental disclosures). For example, a firm reports in the notes of financial statement that it operates two geographical segments, but reports the earnings from operations in the introductory annual report information and/or management discussion based on two industry segments, such as

hotel business and rental business. This study holds that both sources are disclosed inconsistently.

The other definition, “partial consistency”, refers to companies where the introductory annual report information and/or management discussion segment information partially agrees with the segment information in the notes of financial statements. The “partial consistency” group can thus be classified into two sub-groups: (a) the “partial consistency (a part of classification)”, and (b) the “partial consistency (a part of classification but difference in the number of segments)”.

First, the “partial consistency (a part of classification)” refers to firms that provide only geographical segment or only industry segment information in the notes of financial statements, but the other parts of the annual reports provide both industry segments and geographical segments. It shows that the classification of segments in the notes of financial statements is subset of that in the other parts of the annual reports.

Second, the “partial consistency (a part of classification but difference in the number of segments)” group refers to firms not only that have the same attribute of the partial consistency (a part of classification), but only those that have an additional attribute - the number of segments in the notes of financial statements does not equal that announced in the other parts of the annual reports (more/less segments than reflected in the segment footnote).

To provide a better understanding, this study gives some examples of the consistency of analysis of segmental disclosures as reflected in Table 4.4.

Table 4.4 The Examples of the Consistency Analysis of Multiple Classes of Segmental Disclosures with the Other Parts of Annual Reports in 2005

Case	The Segmental Disclosures in Footnotes or Financial Statement	The Other Parts of Annual Reports	The Results of Analysis
1	Geographical Segment (3 items)	Geographical Segment (3 items)	Consistency
2	Geographical Segment (3 items)	Industry Segment (2 items)	Inconsistency
3	Geographical Segment (3 items)	Geographical Segment (2 items)	Consistency (same classification but difference in the number of segments)
4	Geographical Segment (3 items)	Both of Industry (2 items) and Geographical Segment (3 items)	Partial Consistency (a part of classification)
5	Geographical Segment (3 items)	Both of Industry (2 items) and Geographical Segment (2 items)	Partial Consistency (a part of classification but difference in the number of segments)
6	Industry Segment (2 items)	Industry Segment (2 items)	Consistency
7	Industry Segment (2 items)	Geographical Segment (3 items)	Inconsistency
8	Industry Segment (2 items)	Industry Segment (3 items)	Consistency (same classification but difference in the number of segments)
9	Industry Segment (2 items)	Both of Industry (2 items) and Geographical Segment (3 items)	Partial Consistency (a part of classification)
10	Industry Segment (2 items)	Both of Industry (3 items) and Geographical Segment (2 items)	Partial Consistency (a part of classification but difference in the number of segments)
11	Both of Industry (2 items) and Geographical Segment (3 items)	Geographical Segment (3 items)	Partial Consistency (a part of classification)
12	Both of Industry (2 items) and Geographical Segment (3 items	Industry Segment (2 items)	Partial Consistency (a part of classification)
13	Both of Industry (2 items) and Geographical Segment (3 items)	Geographical Segment (3 items)	Partial Consistency (a part of classification)
14	Both of Industry (2 items) and Geographical Segment (3 items)	Both of Industry (2 items) and Geographical Segment (3 items)	Consistency

Table 4.4 (Continued)

Case	The Segmental Disclosures in Footnotes or Financial Statement	The Other Parts of Annual Reports	The Results of Analysis
15	Both of Industry (2 items) and Geographical Segment (3 items)	Both of Industry (3 items) and Geographical Segment (2 items)	Consistency (same classification but difference in the number of segments)
16	Both of Industry (2 items) and Geographical Segment (3 items)	Only One Industry Segment, One Geographical Segment, or Not Disclose Segmental Information	Inconsistency

4.2.2.2 Analysis of Single Class of Segment Disclosures

In addition to the consistency of multi-segmental disclosures, this study considers the consistency of a single class of segmental disclosures with other parts of the annual reports to determine whether there is just as much a problem of inconsistency. The inconsistencies are perhaps more serious in the case of those companies disclosing only a single class of its business, if no attempt has been made to comply with accounting standards. Therefore, this study assumes that firms do not disclose any segmental information with regard to firms that have a single class of segmental disclosure in addition to firms that actually have a single class of segmental disclosure. The criteria of classifying a firm as consistency or inconsistency will be analyzed in the following manner as indicated as Figure 4.4.

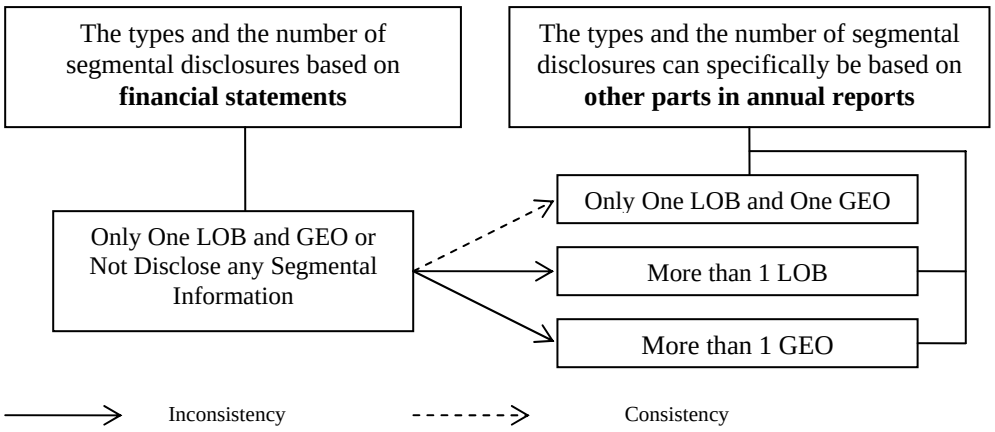

Figure 4.4 The Procedure of Considering the Consistency Analysis of Single Class of Segmental Disclosures with the Other Parts of Annual Reports in 2005

Notes: LOB: Business segments or line of business segments
GEO: Geographical segments

Based on Figure 4.4, the term of "consistency" refers to the company's introductory annual report information and/or management discussion segment information that agrees with the introductory annual report information and/or management discussion segment information (consistent with the types of segmental disclosure and the number of segment items). For example, the firm reports its operation in only one industry segment in both the notes of financial statement and the other parts of the annual report. However, to avoid unnecessary inconsistency, TAS No.24 indicates that 10 percent of consolidated revenue or operating profit or total assets may be used as the guidelines of identifying segment for reporting. Thus, if firms report only a single class of segment or do not identify segment in segment reporting because of the 10% criteria, this study classifies them as "consistency (the transaction is less than 10%)". Another is that firms provide information on industry segments in other parts of their annual report, but those industry segments can be grouped into one segment due to those industry segments being similar. This leads firms to report information on industry broadly. For example, the firm reports that it processes frozen shrimp and frozen fish in the introductory section of its annual report

and/or management discussion section, but the firm reports that its business operates in frozen food. This leads to the classification of "consistency (the transaction can be grouped into one industry)".

In contrast, the term of "inconsistency" relates to companies where the introductory annual report information and/or management discussion segment information does not agree with the segment reporting footnotes (not consistent with the types of segmental disclosure). For example, a firm reports that it operates in one business segment in the notes of its financial statements, but reports that its operations results is based on two industry segments, such as the hotel business and rental business.

The example of the consistency analysis of a single class of segmental disclosure is summarized in Table 4.5.

Table 4.5 The Examples of the Consistency Analysis of Single Class of Segmental Disclosures with the Other Parts of Annual Reports in 2005

Case	The Segmental Disclosures in Footnotes or Financial Statement	The Other Parts of Annual Reports	The Results of Analysis
1	Only One Industry Segment, One Geographical Segment, or Not Disclose Segmental Information	Industry Segment, Geographical Segment, Both Industry and Geographical Segment	Inconsistency
2	Only One Industry Segment, One Geographical Segment, or Not Disclose Segmental Information	Industry Segment, Geographical Segment, Both Industry and Geographical Segment (indicating the transaction is less than 10%)	Consistency (the transaction is less than 10%)
3	Only One Industry Segment, One Geographical Segment, or Not Disclose Segmental Information	Industry Segment (the transaction can be grouped into one industry)	Consistency (the transaction can be grouped into one industry)

In case of considering the quality of segmental disclosure as indicated above, this study summarizes the research methodology into Table 4.6 as follows:

Table 4.6 Summary the Procedure for Considering the Consistency of Segmental Disclosures in 2005

The Procedures
1. Review each set of annual report by focusing on the supplementary information (a) the introductory annual report material including - revenue structure of listed companies, and - items other than the management discussion and audited statements, for example the shareholder's letter, the description of nature business, operations review, etc. (b) the management discussion and analysis 2. Considering the consistency of segment disclosures by using the criteria in Figure 4.3, if firms are in the multiple segment disclosures group 3. Considering the consistency of disclosures by using the criteria in Figure 4.4, if firms are in the single segment disclosures groups or do not disclose any segment information group

In addition to analyzing segment reporting practices of Thai listed companies, another objective is to investigate whether the usefulness of segment information from the perspective that it is enhanced by explanatory information provided elsewhere in the financial statements. Although many researchers in other countries (e.g. U.S., U.K., Australia, etc.) have investigated the usefulness of segmental disclosures, this has not been the case in Thailand. Details of the usefulness of segment information will be discussed below.

4.3 Does Segment Data Provide Incremental Information beyond That Contained in the Firm Level Data?

According to the third research question, this study develops the hypotheses, in Section 4.3.1, and then discusses research design, including the data source and the sample selection, in Section 4.3.2, as well as the methodology for testing in Section 4.3.3.

4.3.1 Hypotheses Development

Many research studies find that accounting data is useful. In foreign countries, like the U.S., most literature suggest that earnings are informative. Although Lev (1989: 153-192) identifies that the usefulness of quarterly and annual earnings to investors is very limited, Bernard and Stober (1989: 624-652) find that the other information, such as cash flows from operations and working capital from operations, are less predictable than that of earnings.

The evidence of incremental information content provided by cash flows beyond earnings of prior studies (e.g. Bowen, Burgstahler and Daley, 1986: 713-725; Rayburn, 1986: 112-133; Wilson, 1987: 293-322, Bernard and Stober, 1989: 624-652) is mixed. However, Finger (1994: 210-223) indicates that past observations of earnings are useful in predicting earnings for the majority of sample firms, and that earnings are a significant predictor of future cash flows. More importantly, Finger (1994: 210–223) infers that when comparing the ability of earnings and that of cash flows to predict future cash flows, the results show that current earnings are better predictors of future cash flows than are current cash flows. Thus, most studies have yet employed the earnings as the important figure in empirical studies.

Later, the change in the economy, such as the shift from an industrialized economy to a high-tech, service oriented economy, made historical cost financial statements lose their information value relevance. Many documents discussed about whether the usefulness of financial information has been deteriorating. For example, Collins, Maydew and Weiss (1997: 39-67) find that the value relevance of earnings has declined over time, having been replaced by the increased value relevance of book values. Contrary to the claims in the professional literature, the combined value relevance of earnings and book values has not declined over time, and, in fact, appears to have increased slightly.

Francis and Schipper (1999: 319-352) examined the ability of earnings to explain annual adjusted returns, and the ability of earnings and book values of assets and liabilities to explain the market value of equity. They also tested the significance of the over time change in ability of accounting information to explain variation in market measures by regressing the adjusted-R^2 on the time variable. The results for

the earnings relation implies a decreases in explained variation overtime, whereas the balance sheet relation or the book value and earnings relations show no evidence of a decline in value relevance. These results can be used to conclude that there has been a decline in the relevance of earnings information, and an increase in the relevance of balance sheet and book value information.

In contrast to the limited research done in Thailand, prior studies (Suchitra Vacharajittipan, 1991: 1-144; Pimpana Srisawadi, 1996: 1-270) report evidence that earnings are informative information. Kanogporn Narktabtee (2000: 29-59) suggested that earnings have incremental information content than beyond cash flow from operations, but cash flows from operations provided incremental information content beyond earnings only in 1996. Similarly, Kanogporn Narktabtee (2000: 87-111) found that investors consider earnings and financing cash flow information in their valuation of equity securities. Consequently, earnings - the premier product of financial disclosure regulations – have been important in Thai empirical studies, like that of U.S.

Graham, King and Bailes (2000: 84-107) examined the value relevance of accounting information in Thailand during the 1997 devaluation of the Thai currency and indicated that Thai book values and earnings have value relevance. However, the total variation in stock prices explained by book value alone increased in the period after the devaluation of the baht, while the variation explained by earnings alone decreased. Accordingly, Punya Sumritpradit (2002: 1-198) also found that earnings and book value can explain security prices.

Although many studies indicate that financial statement information is useful, such information is considered firm-level data. More specifically, now that firms diversify companies into different business sectors, or different geographic areas. The aggregated financial information may not enable the users to relate this information to the different environment in which the diversified entity is operating or evaluate the performance and position of the company in relation to other entities operating in the same areas, because the individual set of activities of each group is different. Different industries and different countries have a variety of profit potentials, degrees and types of risk, and growth opportunities. Hence, segment reporting perhaps provides information on the relative size, profit contribution, and growth trend, of the

different geographical areas in which companies operate to enable users to make more informed judgments about the enterprise as a whole.

In accordance with the Fineness Theorem, the disclosure of a disaggregated complex information signal can enhance the understanding as well as a improve the prediction of future values of the information series.

Indeed, most users of financial statements may view this information as potentially beneficial, but many feel that segment data, especially segment earnings, are likely to be contaminated by measurement errors arising from segment identification, cost allocation, transfer pricing, and management manipulation that they would mislead investors (Collins, 1975: 125; Collins and Simonds, 1979: 356; Givoly, Hayn and D'Souza, 1999: 15). All procedures concerning segment reporting are essentially arbitrary, so the reliability of the resultant segment data is frequently questioned. Consistent with TAS No.24, segment information also involves judgment by management in determining how the enterprise activities are to be grouped for reporting as segments. Such decisions also include those about the identification of segments and about the allocation of revenues and expenses to those segments.

This study is needed to examine the usefulness of segmental reporting by considering whether the segment data provide incremental information beyond that contained in the firm-level data.

The prior research studies about segmental disclosures as reflected in previous chapter focus on two main classifications: (a) earnings prediction, and (b) for security price. With the first classification, Kinney (1971: 127-136), Collin (1976: 163-177), and Balakrishnan, Harris and Sen (1990: 305-325) provide the empirical evidence that earnings forecasts generated by statistical models based on segment data are more accurate than those based only on consolidated financial information. Baldwin (1979: 376-389) examined the relationship between segmental data and earnings forecast accuracy by using the predictive ability of analysts' forecasts to also provide evidence that the segmental disclosures can help them with providing more accurate earnings predictions.

While the studies on earnings prediction have reported results consistent with the proportion that the general availability of segmental data (as opposed to consolidated data only) can be associated with improved earnings forecasts, many

studies concerned with the relationship between segment disclosures and security price are inconclusive. For example, Ajinkya (1980: 343-361) failed to observe any significant differences among the mean returns of the various portfolios within either period (before-and after-line of business period). For return differences between the two periods, the evidence also fails to provide statistically significant. Swaminathan (1991: 23-41) found that significant stock price reactions at the time of release of the line-of-business information. Lobo, Kwon and Ndubizu (1998: 969-985) also observed a significant increase in stock price variability at the time of first disclosure of annual reports containing SFAS No.14 segment data. They also found a significant increase in security analysts' earnings forecast accuracy following the release of this information. Thus, they concluded that SFAS No.14 segment disclosures conveyed incremental information over previously reported SEC line of business information that is relevant to stockholders and to security analysts. Boatsman, Behn and Patz (1993: 46-64) found a significant association only in situations in which unexpected geographic segment earnings were very large, while Thomas (2000: 133-155) showed that a significant difference in the valuation of unexpected earnings across geographic segments existed, for the leading period returns model.

In summary, many literature in foreign countries, like the U.S., examine the proposition that segment disclosures have information content, although results are inconclusive. In contrast, in Thailand, there is no empirical research directly done on the issue of segment reporting. For each reported segment based on TAS No.24, firms should disclose financial information, such as sales or other operating revenues, segment results, and segment assets employed. If the segmental information is useful, the segment data will provide incremental information beyond that contained in the firm-level data. This leads to set the first hypothesis as follows.

H1: Segment earnings provide information beyond consolidated earnings.

The next section will discuss the research design, including the data sources, sample selection, and research methodology.

4.3.2 Data Sources and Sample Selection

Based on the data sources of the first research question, the sample of the third research question consists of listed companies reporting segment information for more

than one segment during the period 1994-2005. Such firms should present segment information as either industry segments or geographical segments. This sample excludes the listed companies in the financial institution industry by the reasons as reflected in Section 4.1.1, as well as excludes firms having a negative value in stockholders' equity. Because the negative book values represent those firms having liquidation status, they are not desirable. Hence, there are no reasons to use the negative book value to price the stock.

Furthermore, the selected companies must have a common year end. Based on Table 4.1, December 31st is the most popular year end and is thus chosen as the common year end.

When focusing on the appropriate date to collect the price, it appears that the listed companies are required to disclose important information in line with the accounting period as shown in Table 4.7.

Table 4.7 Reporting of Information in Line with Accounting Period

Type of Information	Time Period
- Audited annual financial statements[1]	Within 90 days of the end of the accounting period
- Quarter financial statements reviewed by an auditor	Within 45 days of the end of each quarter
- Annual report	Within four months of the end of the accounting period
- Disclosure report of additional information (Formed 56-1)	Within three months of the end of the accounting period.

Source: The Stock Exchange of Thailand

Note: 1 A listed company chooses to submit the audited mid-year or annual financial statements within 60 days of the end of the accounting period in lieu of submitting the second or fourth quarter financial statements, respectively.

This leads to employ the actual dates which the listed companies send their financial statements to the SET for the collection the security prices. Such dates are collected from the news section of the SETSMART (SET Market Analysis and

Reporting Tool) database at the Maruay Library of the SET. However, the dates of sending 1994 financial statements to the SET are not contained in this database. This leads to the manual collection from the SET Daily News.

In the same way, the prices of such dates are extracted from the I-SIMS CDs, Listed Company Info CDs issued by the SET, and SETSMART database. If any securities do not have trading on the date of submitting financial statements, this study employs the price at the first date within five days after the listed companies send the financial statements to the SET.

4.3.3 Research Methodology

The tests of this study regarding the roles of financial statements are firstly based on a regression of the market value of equity (prices) on the two primary summary measures from the balance sheet and income statement, equity book value and earnings by using the following simplified version of the Ohlson model employed, among others, by Collins, Maydew and Weiss (1997: 36-67), Giner and Reverte (1999: 609-629).

$$P_{it} = \alpha_{0t} + \alpha_{1t} BV_{it} + \alpha_{2t} E_{it} + \varepsilon_{it} \qquad \text{(Equation 4.1)}$$

where P_{it} : the price per share of firm i on the date of submitting financial statements to the SET ;

BV_{it} : book value of equity per share of firm i at the end of accounting period t ;

E_{it} : the income before extraordinary items per share of firm i at the end of accounting period t ;

Based on Equation 4.1, this study expects that the coefficients, α_{1t} and α_{2t}, are significant, and the value of adjusted-R^2 is more than zero. These results suggest that earnings and book value can explain security price.

This study then decomposes the income before extraordinary items into segment earnings, the eliminated transaction, and the adjusted items. In general, each company

defines the profitability of segment differently, so that the adjusted items are the remaining items (the difference in segment results (segment earnings) and the income before extraordinary items) which are not included to calculate the segment results. For example, if a firm reports segment earnings as gross profit, the adjusted item is the result of income before extraordinary items less such segment earnings. If firms report two items of segment earnings, such as gross profit, and earnings before interest and tax, this study uses the final line of segment earnings, that is, earnings before interest and tax, as the segment earnings. In contrast, the eliminated transaction is the reconciliation, the adjusting transaction, or the intersegment transaction among business transactions. Several companies show the eliminated transaction as a column in segment reporting. This transaction cannot directly identify each segment. This study investigates whether segment earnings provide information beyond that of consolidated earnings based on the first hypothesis by using the following model:

$$P_{it} = \alpha_{0t} + \alpha_{1t} BV_{it} + \alpha_{2t} other_{it} + \alpha_{3t} Eli_{it} + \sum_{j=1}^{n} \alpha_{3+j,t} e_{i,j,t} + \varepsilon_{it} \quad \text{(Equation 4.2)}$$

where $e_{i,j,t}$: the segment results per share of the segment j of firm i at the end of accounting period t;

$other_{it}$: the adjusted items making the sum of segment results equals the income before extraordinary items per share of firm i at the end of accounting period t;

Eli_{it} : eliminated transaction in segment reports (per share) of firm i at the end of accounting period t.

To apply a uniform regression model to the sample which consists of firms with different segments, this study ranks segments by sales. One reason is that net sales is generally an intuitively appealing measure of firm performance reported frequently in the financial press. This approach can measure the size of segment relative to firm size. Keating (1997: 243-273) also found that the use of firm stock price in evaluating division manager performance is positively related to division size relative to firm size. When decomposing financial summary measures (e.g. earnings of a firm) into

different segments, investors possibly value each segment differently and are likely to focus on the largest segment rather the small segments in assessing the opportunity for investment. This study then examines whether segment data provide incremental information beyond firm level data by using size to classify the segment. At least, if decomposing the firm level data and showing the explanatory power of decomposing model exceed that of basic model (Equation 4.1), the findings suggest that segment data provide information beyond firm level data. Moreover, if the coefficient of the largest segment is significant, it is reasonable to suggest that investors focus on the largest segment and are likely to evaluate the performance of firms using the firms stock prices. By this reason, the index j =1 (segment 1) refers to the largest segment (based on sales) of the firm, j =2 refers to the second largest segment, etc.

In addition, to apply a uniform regression model (with the same number of variables) to the sample which consists of firms with a different number of segments, only the number of segments less than or equal to the mean values was considered. When more than mean values existed, the values for these segments were aggregated with the mean values from those of the last largest segments.. For example, the mean value in the number of segments is 3.25, so only three segments are considered. Hence, when more than three segments exist, the values of these segments are combined with the third segments.

Based on Equation 4.2, this study expects that the coefficients, specifically $\alpha_{3+j,t}$, are different from zero. These results suggest that the segment earnings have informativeness. When comparing the explanatory power (the adjusted-R^2) of the regression model based on Equation 4.2 it should exceed that of the model based on Equation 4.1, the findings suggest that segment earnings provide information beyond consolidated earnings. In fact, the adjusted-R^2 is a measure of the percentage of explained variation in the dependent variable that takes into account the relationship between the sample size and the number of independent variables in the regression model. This measure penalizes models for added explanators, balancing a smaller sum of the residuals against adding explanators that do not really belong to the model.

In addition to using the adjusted-R^2 measure in the above model, this study uses Akaike Information Criterion (AIC) and Schwarz Criterion (SC or Bayesian Information Criterion: BIC) to compare the criterion value between two models or among various models.[8] Gujarati (2003: 537-538) suggests that the AIC and BIC statistics are useful for not only in-sample but also out-of-sample forecasting performance of a regression model, while those statistics are useful for both nested and non-nested models. The models with the lowest value of AIC and BIC are preferred. Stewart (2005: 539) indicates that in the study of Mills and Prasad (1992: 222) concluded that on balance of the BIC "… should probably be the first choice of applied researchers".

4.4 Is Future Performance More Strongly with Segment Reporting Information Than with Aggregated Information?

According to the fourth research question, this study develops the hypotheses, in Section 4.4.1 and then discusses the research design including the data source and sample selection, in Section 4.4.2, as well as the methodology for testing, in Section 4.4.3.

4.4.1 Hypotheses Development

The objective of financial statements is to provide information about the financial position, performance and changes in financial position of an enterprise that is useful to a wide range of users in making economic decisions (ICAAT, 2001: 23). In general, predictive ability is an important quality of accounting information that requires careful investigation. The capacity of accounting information makes a difference in a decision by helping users to form predictions about the outcomes of past, present, and future events or to confirm or correct prior expectations (FASB, 1983; ICAAT, 2001: 26). If earnings quality is a particularly important feature of the

[8] Stewart (2005: 539) indicates that the AIC and BIC differ in the penalties they impose on additional coefficients. Comparing the two penalty terms, the BIC 's is larger than the AIC 's as long as log $n > 2$, or $n > e^2 = 7.389$, establishing that for realistic sample sizes the *BIC* incorporates a larger penalty for additional parameters than does the AIC.

financial reporting product, investors buy earnings. However, investors do not buy current earnings, thus the quality of earnings is a question of the quality of forward earnings. Current earnings are an input to forecasting future earnings, and then current earnings are of good quality if they are a good indication of future earnings. Consistent with Finger (1994: 210-223), the empirical study indicates that earnings are a significant predictor of future earnings. However, when the income of a group (consolidated income) is the result of the incomes of segments which may vary according to the different economic situations faced by the segments, the decomposition of aggregated data (earnings and /or revenues) will give insight into the different developments of segments and enable investors to assess future performance better.

According to prior literature (e.g. Kinney, 1971: 127-136; Barefield and Comiskey, 1975: 818-821; Collins, 1976: 163-177; Baldwin, 1979: 376-389; Silhan 1982: 255-262; etc.), the empirical evidence shows that segment information is useful. In accordance with the Fineness Theorem, when applied to the area of segmental disclosures (e.g. geographic segmental data, or line-of-business segmental data), the disclosures of disaggregated complex information signals can enhance the understanding and improve the prediction of future values of the information series. Likewise, if segmental information is a better measure of firm performance than that of summary measures, then future performance should be more strongly associated with segmental information than with those summary measures. Hence, this study hopes to investigate whether the segment reporting information enhance investors ability to predict future sales or earning by using the conceptual diagram as shown in Figure 4.5.

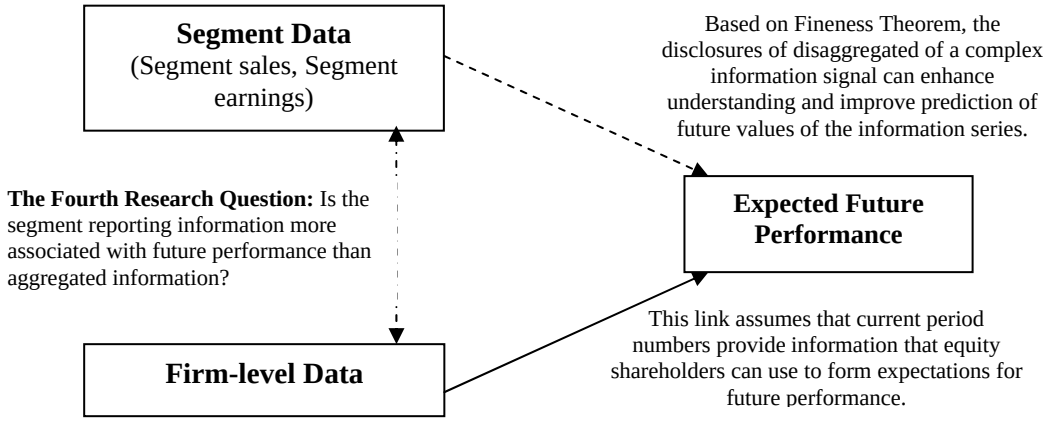

Figure 4.5 The Conceptual Diagram of the Fourth Research Question

When TAS No.24 required listed companies to disclose segment sales, segment operating income, and segment assets, Ahadiat (1993: 360) suggested that the usefulness could be evaluated by the predictive value of future events (i.e. earnings or sales). Because analysts rely on reported earnings in preparing forecasts, accounting quality is expected to be related to the predictability and accuracy of earnings forecasts. Analysts' forecasts for high (low) accounting quality firms are expected to be more (less) predictable, less (more) subject to changes, and more (less) accurate (Imhoff, 1992: 109). In the same direction, if segment earnings are a better measure of firm performance than consolidated earnings are, then future earnings should be more strongly associated with segment earnings than with consolidated earnings. This leads to set the following hypothesis:

H2: Future earnings should be more strongly associated with segment earnings than with consolidated earnings

In addition to segment earnings (segment results), TAS No.24 requires an enterprise to disclose sales for each reported industry and geographical segment. In general, net sales are an intuitively appealing measure of firm performance reported frequently in the financial press. Sales are normally less subject to distortion or manipulation than are other fundamentals, such as earnings per share or book value. Many literatures (i.e. Swaminathan and Weintrop, 1991: 418-427; Biddle, Seow and Siegel, 1995: 1-23; Jenkins, Kane and Velury, 2004: 5-20) provide that sales amounts

are useful information. This study also tests whether segment sales data are a better measure of firm performance than consolidated sales data. If the evidence shows that segment sales are a better measure of future preliminary firm performance, then future preliminary firm performance should be more strongly associated with segment sales than with consolidated sales. This leads to set the following hypothesis.

H3: Future sales should be more strongly associated with segment sales than with consolidated sales.

This leads to next section to discuss the data sources, the sample selection, and the methodology as follows:

4.4.2 Data Sources and Sample Selection

The sample selection of the fourth research question relies on the listed companies reporting segment information of more than one segment in the period 1994-2005. Moreover, the sample also excludes the listed companies in the financial institution industry, such as firms in banking, finance and securities, and insurance sector by the reason given previously. Moreover, the selected companies must have a common year end. Otherwise, distortions can result from seasonality. Based on Table 4.1, December 31 is the most popular year end and is thus chosen as the common year end.

4.4.3 Research Methodology

To test the second research hypothesis, this study initiates to apply the simple approach as follows.

$$E_{it+1} = \alpha_{0t} + \alpha_{1t} E_{it} + \varepsilon_{it} \qquad \text{(Equation 4.3)}$$

where E_{it} : the operating earnings of firm i at the end of accounting period t ; and

E_{it+1} : the operating earnings of firm i at the end of accounting period $t+1$.

This criterion is designed to measure how well past values of an earnings measure predict future values of that measure. As shown by Ball and Brown (1968: 159-178), they try to identify an earnings report's "unexpected" component, which is just the difference between actual earnings and what was expected, or forecasted. Brown (2001: 61) indicated that in the absence of an explicit earnings forecast, it can be simulated by mechanical models. The martingale or random walk assumption models assume that this year's expected earnings are identical to last year's actual earnings, the basis of their "naive" model. In the same way, if earnings of this year are a better measure of future firm performance (future earnings), they should be associated with the firm's future performance (future earnings).

In the same direction, if segment earnings are a better measure of firm performance than consolidated earnings are, future earnings should be more strongly associated with segment earnings than with consolidated earnings. This study places firm-level earnings with segment earnings. As a result, the model for testing such a hypothesis is as follows:

$$E_{it+1} = \alpha_{0t} + \alpha_{1t} other_{it} + \alpha_{2t} Eli_{it} + \sum_{j=1}^{n} \alpha_{j+2,t} e_{i,j,t} + \varepsilon_{it} \qquad \text{(Equation 4.4)}$$

where $e_{i,j,t}$: the segment results of the segment j of firm i at the end of accounting period t.

This study scales every variable by the total assets of firm i at the prior fiscal year. The index of the j^{th} segment observation is the same as indicated in Section 4.3.3. To apply a uniform regression model (with the same number of variables) to the sample which consists of firms with a different number of segments, only the number of segments less than or equal to the mean values was considered. This study also compares the explanatory power (the adjusted-R^2) of each regression model to consider the association of alternative income measures with future income. If segment earnings are a better measure of firm performance than consolidated earnings

are, the explanatory power (the adjusted-R^2) of the model based on Equation 4.4 should exceed that of the model based on Equation 4.3.

Furthermore, this study tests whether segment sales are a better measure of firm performance than are consolidated sales, based on the third hypothesis. If the evidence shows that segment sales are a better measure of future preliminary firm performance (future sales), then future sales should be more strongly associated with segment sales than with consolidated sales. The models are as follows:

$$S_{it+1} = \alpha_{0t} + \alpha_1 S_{it} + \varepsilon_{it} \qquad \text{(Equation 4.5)}$$

$$S_{it+1} = \alpha_{0t} + \alpha_{1t} Eli_{it} + \sum_{j=1}^{n} \alpha_{j+1,t} s_{i,j,t} + \varepsilon_{it} \qquad \text{(Equation 4.6)}$$

where S_{it} : the consolidated sales of firm i at the end of accounting period t;

S_{it+1} : the consolidated of firm i at the end of accounting period $t+1$; and

$s_{i,j,t}$: the segment sales the segment j of firm i at the end of accounting period t.

This study scales every variable by sales of firm i at the prior fiscal year.[9] The index of the j^{th} segment observation is the same as indicated above. To apply a uniform regression model (with the same number of variables) to the sample which consists of firms with a different number of segments, only the number of segments less than or equal to the mean values was considered. This study compares the explanatory power (the adjusted-R^2) of each regression model to consider the association of alternative measures with future sales. If segment sales are a better measure of preliminary firm performance than are consolidated sales, then the explanatory power (the adjusted-R^2) of the model based on Equation 4.6 should exceed that of the model based on Equation 4.5. Besides, this study uses AIC and BIC

[9] This study firstly tests by scaling every variable by total asset/book value of firm i at the prior fiscal year and by number of shares outstanding, but has yet met the severe heteroskedasticity problem. However, when using the number of shares outstanding and transforming the data by using log-lin model. The variable with per share data provides a better understanding than the variable divided by total asset or by book value when using the model with the log-lin model. It appears that the residuals is nonnormal, even though plotted with normal probability plot.

statistics to compare each pair of equation (Equation 4.3 vs. Equation 4.4, and Equation 4.5 vs. Equation 4.6). The model with the lowest value of AIC and BIC is preferred.

The next chapter will discuss the empirical findings based on the research design explained in this chapter. Chapter 5 explores the empirical findings of segment reporting practices in Thailand, while Chapter 6 reveals the empirical results of the usefulness of segmental information.

CHAPTER 5

THE EMPIRICAL RESULTS OF SEGMENT REPORTING PRACTICES IN THAILAND

This chapter presents the empirical results of segment reporting practices in Thailand consisting of two research questions as follows.

(a) How do listed companies disclose their segmental information?

(b) Are segmental disclosures of listed companies in the notes of financial statements consistent with those in other parts of the annual reports in 2005?

Details regarding empirical results of each research questions are discussed below.

5.1 How do Listed Companies Disclose their Segmental Information?

In answering this question, this study tries to describe and evaluate the segment reporting information provided by Thai listed companies through the implementation of the accounting standard. A survey was made of segment reporting practices of 4,199 firms during 1992- 2005. Each financial statement was analyzed and a data sheet created based on (a) how the listed companies identify their segments (i.e. business segments or geographical segments), and (b) what types of accounting information was provided in segment reports.

To maximize the accuracy of the data, all information included within each of the financial statements and footnotes, which had been audited, was reviewed a second time by a certified professional accountant.[10] Table 5.1 summarizes the disclosure practices of the entire sample of Thai listed companies during the year 1992–2005, by classifying the companies into two main groups: (a) the group of

[10]This person graduated with Bachelor's degree and Master's degree in Accounting from Chulalongkorn University, as well as has experienced in accounting fields (e.g. internal auditing, business development, accounting manager, system analyst, etc.) over 10 years.

"segmental information" and (b) the group "do not disclose any segmental information". The former group refers to the group of firms disclosing segmental information as a topic, such as a topic of "a summary of significant accounting policy", a topic of "segment information", a topic of "disclosure of sectoral operation", a topic of "data by division", etc., in notes of financial statements. Within these topics, if a firm claims to operate in more than one segment, this study classifies it into the "multi-segment firms" category, while if firm claims to operate in only one business and geographical segment, this study classifies it into "single segment firms" category. The major difference between the "single segment firms" group and the "firms that do not disclose any segmental information" group is that the first group refers literally to segment reporting or disclose only one segment, while the latter means that the group does not mention anything about its segments.

Table 5.1 Disclosure Practices of Sample Companies

Panel A: Companies with Year Ends December

Data Set in Year	Segmental Information[1]						Do Not Disclose any Segmental Information[4] Data Set in Year		Totals	
	Multi-Segment Firms[2]		Single Segment Firms[3]		Totals					
	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%
1992	4	3.45	n.a.[5]	-	4	3.45	112	96.55	116	100.00
1993	5	3.88	n.a.[5]	-	5	3.88	124	96.12	129	100.00
1994	68	31.34	29	13.36	97	44.70	120	55.30	217	100.00
1995	109	36.21	66	21.93	175	58.14	126	41.86	301	100.00
1996	140	42.68	75	22.87	215	65.55	113	34.45	328	100.00
1997	159	48.77	65	19.94	224	68.71	102	31.29	326	100.00
1998	161	50.63	83	26.10	244	76.73	74	23.27	318	100.00
1999	173	56.72	85	27.87	258	84.59	47	15.41	305	100.00
2000	165	55.93	97	32.88	262	88.81	33	11.19	295	100.00
2001	184	63.23	88	30.24	272	93.47	19	6.53	291	100.00
2002	190	65.07	83	28.42	273	93.49	19	6.51	292	100.00
2003	211	65.94	93	29.06	304	95.00	16	5.00	320	100.00
2004	228	66.47	101	29.45	329	95.92	14	4.08	343	100.00
2005	253	68.19	103	27.76	356	95.96	15	4.04	371	100.00

Table 5.1 (Continued)

Panel B: Companies with Year Ends Other than December

Data Set in Year	Segmental Information[1]						Do Not Disclose any Segmental Information[4] Data Set in Year		Totals	
	Multi-Segment Firms[2]		Single Segment Firms[3]		Totals					
	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%
1992	0	0.00	n.a.[5]	-	0	0.00	3	100.00	3	100.00
1993	0	0.00	n.a.[5]	-	0	0.00	7	100.00	7	100.00
1994	2	13.33	0	0.00	2	13.33	13	86.67	15	100.00
1995	10	45.45	4	18.18	14	63.64	8	36.36	22	100.00
1996	12	50.00	4	16.67	16	66.67	8	33.33	24	100.00
1997	13	59.09	5	22.73	18	81.82	4	18.18	22	100.00
1998	15	68.18	4	18.18	19	86.36	3	13.64	22	100.00
1999	15	75.00	3	15.00	18	90.00	2	10.00	20	100.00
2000	15	78.95	3	15.79	18	94.74	1	5.26	19	100.00
2001	13	72.22	4	22.22	17	94.44	1	5.56	18	100.00
2002	14	82.35	2	11.76	16	94.12	1	5.88	17	100.00
2003	16	88.89	1	5.56	17	94.44	1	5.56	18	100.00
2004	17	85.00	2	10.00	19	95.00	1	5.00	20	100.00
2005	17	85.00	2	10.00	19	95.00	1	5.00	20	100.00

Panel C: Total Listed Companies (Final Sample Size)

Data Set in Year	Segmental Information[1]						Do Not Disclose any Segmental Information[4]		Totals	
	Multi-Segment Firms[2]		Single Segment Firms[3]		Totals					
	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%
1992	4	3.36	n.a.[5]	-	4	3.36	115	96.64	119	100.00
1993	5	3.68	n.a.[5]	-	5	3.68	131	96.32	136	100.00
1994	70	30.17	29	12.50	99	42.67	133	57.33	232	100.00
1995	119	36.84	70	21.67	189	58.51	134	41.49	323	100.00
1996	152	43.18	79	22.44	231	65.63	121	34.38	352	100.00
1997	172	49.43	70	20.11	242	69.54	106	30.46	348	100.00
1998	176	51.76	87	25.59	263	77.35	77	22.65	340	100.00

Table 5.1 (Continued)

Data Set in Year	Segmental Information[1]						Do Not Disclose any Segmental Information[4]		Totals	
	Multi-Segment Firms[2]		Single Segment Firms[3]		Totals					
	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%
1999	188	57.85	88	27.08	276	84.92	49	15.08	325	100.00
2000	180	57.32	100	31.85	280	89.17	34	10.83	314	100.00
2001	197	63.75	92	29.77	289	93.53	20	6.47	309	100.00
2002	204	66.02	85	27.51	289	93.53	20	6.47	309	100.00
2003	227	67.16	94	27.81	321	94.97	17	5.03	338	100.00
2004	245	67.49	103	28.37	348	95.87	15	4.13	363	100.00
2005	270	69.05	105	26.85	375	95.91	16	4.09	391	100.00

Notes: 1 Firm reports segment information in a topic of "a summary of significant accounting policy", a topic of "segment information", a topic of "disclosure of sectoral operation", a topic of "data by division", or a topic that have similar meanings in the notes of financial statement.

2 The "multi-segment firms" group consists of firms that report their operations having more than one segment (e.g. industry segments, geographical segments, or both industry and geographical segments) and have to disclose financial information (such as sales, segment results, or segment assets employed).

3 The "single segment firms" group consists of firms that reveal their operations having only one segment in notes of financial statements.

4 Firm does not report any segment information as a topic in the notes of financial statement.

5 During 1992-1993, there is no accounting standard requiring listed companies disclose segment reporting as a topic in notes of financial statements.

Panel A of Table 5.1 shows the proportion of the nature of segmental disclosure of firms for each year ending in December, while Panel B of Table 5.1 shows the firms with their fiscal year ending other than in December. The reason behind this classification is that the origin of segmental disclosure arises from TAS No.24 issued by the ICAAT and made effective for fiscal years beginning on or after January 1, 1994. Some firms with year ending other than in December could have possibly reported segmental information in 1994. This study classifies those firms as the group of firms voluntary reporting segments. Finally, Panel C of Table 5.1 is the total amount of listed companies disclosing segmental information.

Table 5.1 shows that hardly any listed companies voluntarily disclosed segment information in the notes of their financial statements before TAS No.24 became effective, i.e. only 4 and 5 companies in 1992 and 1993, respectively. There are 2 companies whose year ended other than in December in 1994 which can be classified as the group of voluntary reporting segments.

All three panels further indicate that the tendency of firms to disclose segment information as a topic in their financial statements grew remarkably since the TAS No.24 became effective. The proportion of firms disclosing segmental information has increased dramatically from roughly 43 percent in 1994 to approximately 96 percent in 2005. Among 391 firms in 2005, 270 firms disclosed multi-segment information, 105 firms disclosed single segment information and 16 firms did not mention anything about segment reporting as a topic in the notes of their financial statements. The latter group does not imply that firms not disclosing segmental information avoid complying with TAS No.24, but rather this standard enforces only listed companies operating in different industries and different geographical areas. Thus, it is highly possible that firms that did not disclose any segmental information as a topic in the notes of their financial statements have entities that operate in only one business or geographical area.

For further analysis, this study combined the number of single segment firms with the number of firms not disclosing any segment information as a topic in the notes of their financial statements and finds that the number of listed companies presenting information by multi-segments increased each year, according to Figure 5.1.

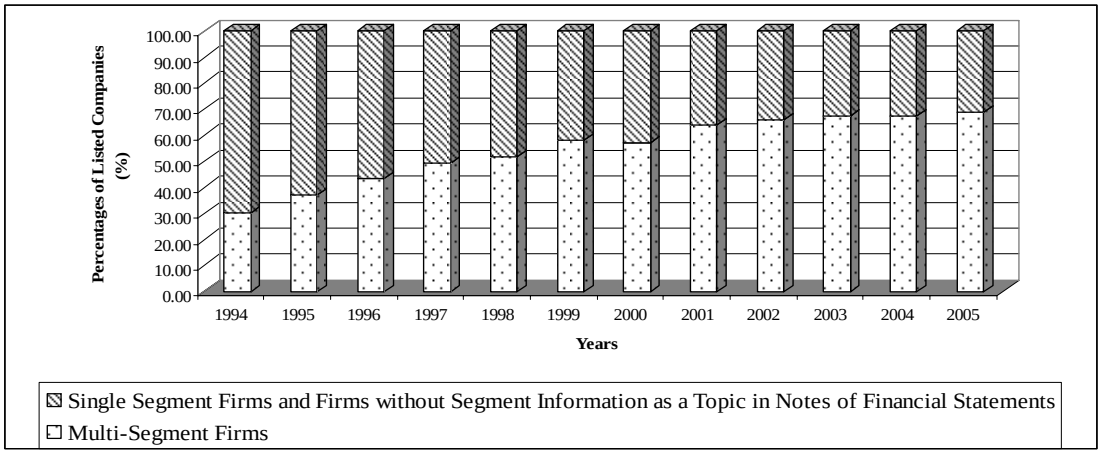

Figure 5.1 Percentages of Listed Companies Reporting Multi-Segment Information in Notes of Financial Statements (1994-2005)

Source: Table 5.1, Panel C

Figure 5.1 shows that since the year 1998, the percentages of firms which reported multi-segmental disclosures have been higher than the percentages of firms which claim to have operated in one segment. The results imply two possible explanations. One is the sample firms have increasingly diversified their operations into different industries, or the important role of segment reporting has been realized and implemented after being issued for a period of time.

This study further investigated multi-segment firms and found that these firms identified their segments using various formats, such as industry (or line of business format), geographical format, and both dimensions. In addition, the result shows that some firms report their segment information under the name of its subsidiaries, especially during the first few years after TAS No.24 was promulgated. The results of the multi-segment classification are shown in Table 5.2.

Table 5.2 The Nature of Segmental Disclosures of Multi-Segment Firms

Panel A: Companies with Year Ends December

Data Set in Year	Industry/Line-of-business Format		Geographical Format		Both Industry and Geographic Format		Company Group[1]		Total	
	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%
1992	3	75.00	1	25.00	0	0.00	0	0.00	4	100.00
1993	4	80.00	1	20.00	0	0.00	0	0.00	5	100.00
1994	34	50.00	18	26.47	11	16.18	5	7.35	68	100.00
1995	57	52.29	22	20.18	16	14.68	14	12.84	109	100.00
1996	71	50.71	38	27.14	16	11.43	15	10.71	140	100.00
1997	83	52.20	42	26.42	20	12.58	14	8.81	159	100.00
1998	87	54.04	41	25.47	20	12.42	13	8.07	161	100.00
1999	96	55.49	44	25.43	23	13.29	10	5.78	173	100.00
2000	94	56.97	42	25.45	24	14.55	5	3.03	165	100.00
2001	97	52.72	58	31.52	24	13.04	5	2.72	184	100.00
2002	98	51.58	54	28.42	31	16.32	7	3.68	190	100.00
2003	102	48.34	62	29.38	38	18.01	9	4.27	211	100.00
2004	114	50.00	68	29.82	40	17.54	6	2.63	228	100.00
2005	134	52.96	72	28.46	41	16.21	6	2.37	253	100.00

Panel B: Companies with Year Ends Other than December

Data Set in Year	Industry/Line-of-business Format		Geographical Format		Both Industry and Geographic Format		Company Group[1]		Total	
	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%
1992	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
1993	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
1994	1	50.00	1	50.00	0	0.00	0	0.00	2	100.00
1995	6	60.00	4	40.00	0	0.00	0	0.00	10	100.00
1996	7	58.33	5	41.67	0	0.00	0	0.00	12	100.00
1997	7	53.85	6	46.15	0	0.00	0	0.00	13	100.00
1998	8	53.33	6	40.00	0	0.00	1	6.67	15	100.00
1999	8	53.33	6	40.00	0	0.00	1	6.67	15	100.00
2000	9	60.00	5	33.33	0	0.00	1	6.67	15	100.00
2001	9	69.23	4	30.77	0	0.00	0	0.00	13	100.00

Table 5.2 (Continued)

Data Set in Year	Industry/Line-of-business Format		Geographical Format		Both Industry and Geographic Format		Company Group[1]		Total	
	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%
2003	6	37.50	8	50.00	2	12.50	0	0.00	16	100.00
2004	6	35.29	9	52.94	2	11.76	0	0.00	17	100.00
2005	6	35.29	9	52.94	2	11.76	0	0.00	17	100.00

Panel C: Total listed companies (Final Sample Size)

Data Set in Year	Industry/Line-of-business Format		Geographical Format		Both Industry and Geographic Format		Company Group[1]		Total	
	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%	Numbers of firms	%
1992	3	75.00	1	25.00	0	0.00	0	0.00	4	100.00
1993	4	80.00	1	20.00	0	0.00	0	0.00	5	100.00
1994	35	50.00	19	27.14	11	15.71	5	7.14	70	100.00
1995	63	52.94	26	21.85	16	13.45	14	11.76	119	100.00
1996	78	51.32	43	28.29	16	10.53	15	9.87	152	100.00
1997	90	52.33	48	27.91	20	11.63	14	8.14	172	100.00
1998	95	53.98	47	26.70	20	11.36	14	7.95	176	100.00
1999	104	55.32	50	26.60	23	12.23	11	5.85	188	100.00
2000	103	57.22	47	26.11	24	13.33	6	3.33	180	100.00
2001	106	53.81	62	31.47	24	12.18	5	2.54	197	100.00
2002	104	50.98	61	29.90	32	15.69	7	3.43	204	100.00
2003	108	47.58	70	30.84	40	17.62	9	3.96	227	100.00
2004	120	48.98	77	31.43	42	17.14	6	2.45	245	100.00
2005	140	51.85	81	30.00	43	15.93	6	2.22	270	100.00

Note: 1 Listed companies report segments as companies' name, or business segments plus the group of subsidiary companies. Those companies cannot be exactly classified into which types of segment (business segments, geographical segments, or both).

Table 5.2 is also classified into three components. Panel A of Table 5.2 shows the proportion of the nature of segmental disclosures of firms with their fiscal year ending in December, while Panel B of Table 5.2 reveals the firms with year ending

other than in December. Finally, Panel C of Table 5.2 is the total of listed companies disclosing segmental information.

Table 5.2 reports that 3 and 4 companies reported segments as business segments in 1992 and 1993, respectively. For example, a company disclosed inventory transactions based on its segments in the pharmaceutical and toiletry business, as well as its segment of Fabric, clothes and others; some companies report the percentage of assets or revenues included in their consolidated financial statements based on the nature of their business. Thus, these companies report segments unclearly, because they do not show segments as a topic.

In contrast, listed companies (a company in 1992 and a company in 1993) reported geographical segment sales in the notes of their financial statements were quite easily to identify, because they declared local sales and foreign sales. Similarly, only two companies with year ending other than in December voluntarily reported segments in 1994, i.e. one company reported its segments based on business segments and while another one reported its segments based on geographical segments.

Moreover, all three panels revealed that the tendency of firms was to disclose segment information as business segments, geographical segments, and both dimensions. This trend was quite stable across the period of the study. During 1994-2005, roughly 48-57 percent of firms which disclosed segment information in their financial statements claimed to have operated in more than one business segment. Approximately 22-31 percent disclosed geographical segment and about 11-18 percent disclosed both business segment and geographical segment. These results imply that more companies decided to disclose their segmental information by industry lines rather than by geographical areas as their operating segments. The number of those firms which defined their segment using the company and subsidiaries decreased continuously from 11.76 percent in 1995 to 2.22 percent in 2005.

To consider the distribution of segment identification, Table 5.3 describes types of multi-segments (i.e. business format, geographical format, or both) reported under TAS by industry sectors defined by the SET: (a) agro and food industry, (b) consumers products, (c) industrials, (d) property and constructions, (e) resources, (f) services, (g) technology, and (h) others.

Table 5.3 Types of Multi-Segments Reported under TAS by Industry Sectors of SET

Panel A: Year 2005

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Agro & Food Industry	**16**	**11.43**	**15**	**18.52**	**6**	**13.95**	**37**	**14.02**
- Agribusiness	10	52.63	7	36.84	2	10.53	19	7.20
- Food and Beverage	6	33.33	8	44.44	4	22.22	18	6.82
Consumer Products	**4**	**2.86**	**19**	**23.46**	**9**	**20.93**	**32**	**12.12**
- Household Goods	0	0.00	6	75.00	2	25.00	8	3.03
- Jewelry and Ornaments	0	0.00	0	0.00	0	0.00	0	0.00
- Pharmaceutical Products and Cosmetics	1	33.33	0	0.00	2	66.67	3	1.14
- Textiles, Clothing and Footwear (Fashion)	3	14.29	13	61.90	5	23.81	21	7.95
Industrials	**21**	**15.00**	**11**	**13.58**	**8**	**18.60**	**40**	**15.15**
- Chemicals and Plastics (Petrochemical &Chemical)	5	50.00	4	40.00	1	10.00	10	3.79
- Machinery and Equipment	1	50.00	0	0.00	1	50.00	2	0.76
- Packaging	6	54.55	2	18.18	3	27.27	11	4.17
- Pulp and Paper (Paper and Printing Materials)	0	0.00	0	0.00	1	100.00	1	0.38
- Vehicles and Parts (Automotive)	9	56.25	5	31.25	2	12.50	16	6.06
Property and Constructions	**38**	**27.14**	**15**	**18.52**	**9**	**20.93**	**62**	**23.48**
- Building and Furnishing Materials (Construction Materials)	8	29.63	12	44.44	7	25.93	27	10.23
- Property Development	30	85.71	3	8.57	2	5.71	35	13.26
Resources	**7**	**5.00**	**2**	**2.47**	**4**	**9.30**	**13**	**4.92**
- Energy (Energy & utilities)	5	45.45	2	18.18	4	36.36	11	4.17
- Mining	2	100.00	0	0.00	0	0.00	2	0.76
Services	**40**	**28.57**	**6**	**7.41**	**4**	**9.30**	**50**	**18.94**
- Commerce	8	88.89	0	0.00	1	11.11	9	3.41
- Entertainment and Recreation (Entertainment)	13	81.25	1	6.25	2	12.50	16	6.06
- Health Care Services	2	66.67	1	33.33	0	0.00	3	1.14
- Hotels and Travel Services	6	75.00	2	25.00	0	0.00	8	3.03
- Printing and Publishing	3	100.00	0	0.00	0	0.00	3	1.14
- Professional Services	1	50.00	1	50.00	0	0.00	2	0.76
- Transportation (Transportation & Logistics)	7	77.78	1	11.11	1	11.11	9	3.41

Table 5.3 (Continued)

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
- Warehouse and Silo	0	0.00	0	0.00	0	0.00	0	0.00
Technology	**14**	**10.00**	**13**	**16.05**	**3**	**6.98**	**30**	**11.36**
- Communication	10	76.92	1	7.69	2	15.38	13	4.92
- Electrical Products and Computer	3	33.33	6	66.67	0	0.00	9	3.41
- Electronic Components	1	12.50	6	75.00	1	12.50	8	3.03
Others	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**
- Others	0	0.00	0	0.00	0	0.00	0	0.00
Totals	**140**	**53.03**	**81**	**30.68**	**43**	**16.29**	**264**	**100.00**

Panel B: Year 2004

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Agro & Food Industry	**13**	**10.83**	**12**	**15.58**	**6**	**14.29**	**31**	**12.97**
- Agribusiness	8	50.00	6	37.50	2	12.50	16	6.69
- Food and Beverage	5	33.33	6	40.00	4	26.67	15	6.28
Consumer Products	**2**	**1.67**	**20**	**25.97**	**10**	**23.81**	**32**	**13.39**
- Household Goods	0	0.00	6	75.00	2	25.00	8	3.35
- Jewelry and Ornaments	0	0.00	0	0.00	1	100.00	1	0.42
- Pharmaceutical Products and Cosmetics	1	33.33	0	0.00	2	66.67	3	1.26
- Textiles, Clothing and Footwear (Fashion)	1	5.00	14	70.00	5	25.00	20	8.37
Industrials	**15**	**12.50**	**11**	**14.29**	**9**	**21.43**	**35**	**14.64**
- Chemicals and Plastics (Petrochemical &Chemical)	4	40.00	4	40.00	2	20.00	10	4.18
- Machinery and Equipment	1	50.00	0	0.00	1	50.00	2	0.84
- Packaging	6	60.00	2	20.00	2	20.00	10	4.18
- Pulp and Paper (Paper and Printing Materials)	0	0.00	0	0.00	1	100.00	1	0.42

Table 5.3 (Continued)

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
- Vehicles and Parts (Automotive)	4	33.33	5	41.67	3	25.00	12	5.02
Property and Constructions	**33**	**27.50**	**13**	**16.88**	**7**	**16.67**	**53**	**22.18**
- Building and Furnishing Materials (Construction Materials)	7	31.82	10	45.45	5	22.73	22	9.21
- Property Development	26	83.87	3	9.68	2	6.45	31	12.97
Resources	**6**	**5.00**	**4**	**5.19**	**2**	**4.76**	**12**	**5.02**
- Energy (Energy & utilities)	4	40.00	4	40.00	2	20.00	10	4.18
- Mining	2	100.00	0	0.00	0	0.00	2	0.84
Services	**36**	**30.00**	**5**	**6.49**	**4**	**9.52**	**45**	**18.83**
- Commerce	9	90.00	0	0.00	1	10.00	10	4.18
- Entertainment and Recreation (Entertainment)	10	83.33	0	0.00	2	16.67	12	5.02
- Health Care Services	2	66.67	1	33.33	0	0.00	3	1.26
- Hotels and Travel Services	7	77.78	2	22.22	0	0.00	9	3.77
- Printing and Publishing	2	100.00	0	0.00	0	0.00	2	0.84
- Professional Services	0	0.00	1	100.00	0	0.00	1	0.42
- Transportation (Transportation & Logistics)	3	60.00	1	20.00	1	20.00	5	2.09
- Warehouse and Silo	3	100.00	0	0.00	0	0.00	3	1.26
Technology	**14**	**11.67**	**12**	**15.58**	**3**	**7.14**	**29**	**12.13**
- Communication	9	75.00	1	8.33	2	16.67	12	5.02
- Electrical Products and Computer	5	50.00	5	50.00	0	0.00	10	4.18
- Electronic Components	0	0.00	6	85.71	1	14.29	7	2.93
Others	**1**	**0.83**	**0**	**0.00**	**1**	**2.38**	**2**	**0.84**
- Others	1	50.00	0	0.00	1	50.00	2	0.84
Totals	**120**	**50.21**	**77**	**32.22**	**42**	**17.57**	**239**	**100.00**

Table 5.3 (Continued)

Panel C: Year 2003

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Agro & Food Industry	**13**	**12.04**	**10**	**14.29**	**6**	**15.00**	**29**	**13.30**
- Agribusiness	10	62.50	5	31.25	1	6.25	16	7.34
- Food and Beverage	3	23.08	5	38.46	5	38.46	13	5.96
Consumer Products	**2**	**1.85**	**15**	**21.43**	**11**	**27.50**	**28**	**12.84**
- Household Goods	0	0.00	5	71.43	2	28.57	7	3.21
- Jewelry and Ornaments	0	0.00	0	0.00	1	100.00	1	0.46
- Pharmaceutical Products and Cosmetics	1	50.00	0	0.00	1	50.00	2	0.92
- Textiles, Clothing and Footwear (Fashion)	1	5.56	10	55.56	7	38.89	18	8.26
Industrials	**11**	**10.19**	**14**	**20.00**	**9**	**22.50**	**34**	**15.60**
- Chemicals and Plastics (Petrochemical &Chemical)	4	44.44	4	44.44	1	11.11	9	4.13
- Machinery and Equipment	1	33.33	1	33.33	1	33.33	3	1.38
- Packaging	4	40.00	3	30.00	3	30.00	10	4.59
- Pulp and Paper (Paper and Printing Materials)	0	0.00	1	50.00	1	50.00	2	0.92
- Vehicles and Parts (Automotive)	2	20.00	5	50.00	3	30.00	10	4.59
Property and Constructions	**31**	**28.70**	**10**	**14.29**	**7**	**17.50**	**48**	**22.02**
- Building and Furnishing Materials (Construction Materials)	7	33.33	9	42.86	5	23.81	21	9.63
- Property Development	24	88.89	1	3.70	2	7.41	27	12.39
Resources	**5**	**4.63**	**4**	**5.71**	**1**	**2.50**	**10**	**4.59**
- Energy (Energy & utilities)	3	37.50	4	50.00	1	12.50	8	3.67
- Mining	2	100.00	0	0.00	0	0.00	2	0.92
Services	**34**	**31.48**	**6**	**8.57**	**3**	**7.50**	**43**	**19.72**
- Commerce	12	92.31	1	7.69	0	0.00	13	5.96
- Entertainment and Recreation (Entertainment)	7	77.78	0	0.00	2	22.22	9	4.13
- Health Care Services	2	66.67	1	33.33	0	0.00	3	1.38
- Hotels and Travel Services	5	71.43	2	28.57	0	0.00	7	3.21
- Printing and Publishing	3	100.00	0	0.00	0	0.00	3	1.38
- Professional Services	0	0.00	1	100.00	0	0.00	1	0.46
- Transportation (Transportation & Logistics)	3	60.00	1	20.00	1	20.00	5	2.29

Table 5.3 (Continued)

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
- Warehouse and Silo	2	100.00	0	0.00	0	0.00	2	0.92
Technology	**10**	**9.26**	**9**	**12.86**	**2**	**5.00**	**21**	**9.63**
- Communication	8	80.00	1	10.00	1	10.00	10	4.59
- Electrical Products and Computer	2	33.33	4	66.67	0	0.00	6	2.75
- Electronic Components	0	0.00	4	80.00	1	20.00	5	2.29
Others	**2**	**1.85**	**2**	**2.86**	**1**	**2.50**	**5**	**2.29**
- Others	2	40.00	2	40.00	1	20.00	5	2.29
Totals	**108**	**49.54**	**70**	**32.11**	**40**	**18.35**	**218**	**100.00**

Panel D: Year 2002

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Agro & Food Industry	**13**	**12.50**	**11**	**18.03**	**3**	**9.38**	**27**	**13.71**
- Agribusiness	9	60.00	5	33.33	1	6.67	15	7.61
- Food and Beverage	4	33.33	6	50.00	2	16.67	12	6.09
Consumer Products	**3**	**2.88**	**9**	**14.75**	**10**	**31.25**	**22**	**11.17**
- Household Goods	0	0.00	4	66.67	2	33.33	6	3.05
- Jewelry and Ornaments	0	0.00	0	0.00	1	100.00	1	0.51
- Pharmaceutical Products and Cosmetics	1	50.00	0	0.00	1	50.00	2	1.02
- Textiles, Clothing and Footwear (Fashion)	2	15.38	5	38.46	6	46.15	13	6.60
Industrials	**14**	**13.46**	**12**	**19.67**	**7**	**21.88**	**33**	**16.75**
- Chemicals and Plastics (Pethrochemical &Chemical)	5	55.56	3	33.33	1	11.11	9	4.57
- Machinery and Equipment	0	0.00	1	50.00	1	50.00	2	1.02
- Packaging	4	44.44	3	33.33	2	22.22	9	4.57
- Pulp and Paper (Paper and Printing Materials)	1	33.33	1	33.33	1	33.33	3	1.52
- Vehicles and Parts (Automotive)	4	40.00	4	40.00	2	20.00	10	5.08

Table 5.3 (Continued)

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Property and Constructions	**26**	**25.00**	**9**	**14.75**	**6**	**18.75**	**41**	**20.81**
- Building and Furnishing Materials (Construction Materials)	7	38.89	7	38.89	4	22.22	18	9.14
- Property Development	19	82.61	2	8.70	2	8.70	23	11.68
Resources	**3**	**2.88**	**3**	**4.92**	**2**	**6.25**	**8**	**4.06**
- Energy (Energy & utilities)	1	20.00	2	40.00	2	40.00	5	2.54
- Mining	2	66.67	1	33.33	0	0.00	3	1.52
Services	**34**	**32.69**	**6**	**9.84**	**2**	**6.25**	**42**	**21.32**
- Commerce	11	91.67	1	8.33	0	0.00	12	6.09
- Entertainment and Recreation (Entertainment)	7	77.78	1	11.11	1	11.11	9	4.57
- Health Care Services	2	100.00	0	0.00	0	0.00	2	1.02
- Hotels and Travel Services	5	71.43	2	28.57	0	0.00	7	3.55
- Printing and Publishing	3	100.00	0	0.00	0	0.00	3	1.52
- Professional Services	0	0.00	1	100.00	0	0.00	1	0.51
- Transportation (Transportation & Logistics)	4	66.67	1	16.67	1	16.67	6	3.05
- Warehouse and Silo	2	100.00	0	0.00	0	0.00	2	1.02
Technology	**8**	**7.69**	**9**	**14.75**	**2**	**6.25**	**19**	**9.64**
- Communication	7	87.50	0	0.00	1	12.50	8	4.06
- Electrical Products and Computer	1	16.67	5	83.33	0	0.00	6	3.05
- Electronic Components	0	0.00	4	80.00	1	20.00	5	2.54
Others	**3**	**2.88**	**2**	**3.28**	**0**	**0.00**	**5**	**2.54**
- Others	3	60.00	2	40.00	0	0.00	5	2.54
Totals	**104**	**52.79**	**61**	**30.96**	**32**	**16.24**	**197**	**100.00**

Table 5.3 (Continued)

Panel E: Year 2001

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Agro & Food Industry	**11**	**10.38**	**14**	**22.58**	**3**	**12.50**	**28**	**14.58**
- Agribusiness	8	53.33	6	40.00	1	6.67	15	7.81
- Food and Beverage	3	23.08	8	61.54	2	15.38	13	6.77
Consumer Products	**5**	**4.72**	**11**	**17.74**	**6**	**25.00**	**22**	**11.46**
- Household Goods	0	0.00	4	66.67	2	33.33	6	3.13
- Jewelry and Ornaments	0	0.00	0	0.00	1	100.00	1	0.52
- Pharmaceutical Products and Cosmetics	1	50.00	0	0.00	1	50.00	2	1.04
- Textiles, Clothing and Footwear (Fashion)	4	30.77	7	53.85	2	15.38	13	6.77
Industrials	**17**	**16.04**	**12**	**19.35**	**5**	**20.83**	**34**	**17.71**
- Chemicals and Plastics (Petrochemical &Chemical)	5	50.00	3	30.00	2	20.00	10	5.21
- Machinery and Equipment	0	0.00	1	50.00	1	50.00	2	1.04
- Packaging	5	50.00	3	30.00	2	20.00	10	5.21
- Pulp and Paper (Paper and Printing Materials)	2	66.67	1	33.33	0	0.00	3	1.56
- Vehicles and Parts (Automotive)	5	55.56	4	44.44	0	0.00	9	4.69
Property and Constructions	**26**	**24.53**	**9**	**14.52**	**6**	**25.00**	**41**	**21.35**
- Building and Furnishing Materials (Construction Materials)	9	42.86	8	38.10	4	19.05	21	10.94
- Property Development	17	85.00	1	5.00	2	10.00	20	10.42
Resources	**5**	**4.72**	**2**	**3.23**	**1**	**4.17**	**8**	**4.17**
- Energy (Energy & utilities)	3	60.00	1	20.00	1	20.00	5	2.60
- Mining	2	66.67	1	33.33	0	0.00	3	1.56
Services	**32**	**30.19**	**5**	**8.06**	**1**	**4.17**	**38**	**19.79**
- Commerce	10	90.91	1	9.09	0	0.00	11	5.73
- Entertainment and Recreation (Entertainment)	4	66.67	1	16.67	1	16.67	6	3.13
- Health Care Services	3	100.00	0	0.00	0	0.00	3	1.56
- Hotels and Travel Services	5	83.33	1	16.67	0	0.00	6	3.13
- Printing and Publishing	4	100.00	0	0.00	0	0.00	4	2.08
- Professional Services	0	0.00	1	100.00	0	0.00	1	0.52
- Transportation (Transportation & Logistics)	4	80.00	1	20.00	0	0.00	5	2.60

Table 5.3 (Continued)

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
- Warehouse and Silo	2	100.00	0	0.00	0	0.00	2	1.04
Technology	**8**	**7.55**	**7**	**11.29**	**2**	**8.33**	**17**	**8.85**
- Communication	6	85.71	0	0.00	1	14.29	7	3.65
- Electrical Products and Computer	2	40.00	3	60.00	0	0.00	5	2.60
- Electronic Components	0	0.00	4	80.00	1	20.00	5	2.60
Others	**2**	**1.89**	**2**	**3.23**	**0**	**0.00**	**4**	**2.08**
- Others	2	50.00	2	50.00	0	0.00	4	2.08
Totals	**106**	**55.21**	**62**	**32.29**	**24**	**12.50**	**192**	**100.00**

Panel F: Year 2000

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Agro & Food Industry	**13**	**12.04**	**10**	**14.29**	**6**	**15.00**	**29**	**13.30**
- Agribusiness	10	62.50	5	31.25	1	6.25	16	7.34
- Food and Beverage	3	23.08	5	38.46	5	38.46	13	5.96
Consumer Products	**2**	**1.85**	**15**	**21.43**	**11**	**27.50**	**28**	**12.84**
- Household Goods	0	0.00	5	71.43	2	28.57	7	3.21
- Jewelry and Ornaments	0	0.00	0	0.00	1	100.00	1	0.46
- Pharmaceutical Products and Cosmetics	1	50.00	0	0.00	1	50.00	2	0.92
- Textiles, Clothing and Footwear (Fashion)	1	5.56	10	55.56	7	38.89	18	8.26
Industrials	**11**	**10.19**	**14**	**20.00**	**9**	**22.50**	**34**	**15.60**
- Chemicals and Plastics (Petrochemical &Chemical)	4	44.44	4	44.44	1	11.11	9	4.13
- Machinery and Equipment	1	33.33	1	33.33	1	33.33	3	1.38
- Packaging	4	40.00	3	30.00	3	30.00	10	4.59
- Pulp and Paper (Paper and Printing Materials)	0	0.00	1	50.00	1	50.00	2	0.92
- Vehicles and Parts (Automotive)	2	20.00	5	50.00	3	30.00	10	4.59

Table 5.3 (Continued)

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Property and Constructions	**31**	**28.70**	**10**	**14.29**	**7**	**17.50**	**48**	**22.02**
- Building and Furnishing Materials (Construction Materials)	7	33.33	9	42.86	5	23.81	21	9.63
- Property Development	24	88.89	1	3.70	2	7.41	27	12.39
Resources	**5**	**4.63**	**4**	**5.71**	**1**	**2.50**	**10**	**4.59**
- Energy (Energy & utilities)	3	37.50	4	50.00	1	12.50	8	3.67
- Mining	2	100.00	0	0.00	0	0.00	2	0.92
Services	**34**	**31.48**	**6**	**8.57**	**3**	**7.50**	**43**	**19.72**
- Commerce	12	92.31	1	7.69	0	0.00	13	5.96
- Entertainment and Recreation (Entertainment)	7	77.78	0	0.00	2	22.22	9	4.13
- Health Care Services	2	66.67	1	33.33	0	0.00	3	1.38
- Hotels and Travel Services	5	71.43	2	28.57	0	0.00	7	3.21
- Printing and Publishing	3	100.00	0	0.00	0	0.00	3	1.38
- Professional Services	0	0.00	1	100.00	0	0.00	1	0.46
- Transportation (Transportation & Logistics)	3	60.00	1	20.00	1	20.00	5	2.29
- Warehouse and Silo	2	100.00	0	0.00	0	0.00	2	0.92
Technology	**10**	**9.26**	**9**	**12.86**	**2**	**5.00**	**21**	**9.63**
- Communication	8	80.00	1	10.00	1	10.00	10	4.59
- Electrical Products and Computer	2	33.33	4	66.67	0	0.00	6	2.75
- Electronic Components	0	0.00	4	80.00	1	20.00	5	2.29
Others	**2**	**1.85**	**2**	**2.86**	**1**	**2.50**	**5**	**2.29**
- Others	2	40.00	2	40.00	1	20.00	5	2.29
Totals	**108**	**49.54**	**70**	**32.11**	**40**	**18.35**	**218**	**100.00**

Table 5.3 (Continued)

Panel G: Year 1999

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Agro & Food Industry	**12**	**11.54**	**10**	**20.00**	**3**	**13.04**	**25**	**14.12**
- Agribusiness	8	53.33	5	33.33	2	13.33	15	8.47
- Food and Beverage	4	40.00	5	50.00	1	10.00	10	5.65
Consumer Products	**5**	**4.81**	**10**	**20.00**	**5**	**21.74**	**20**	**11.30**
- Household Goods	0	0.00	3	60.00	2	40.00	5	2.82
- Jewelry and Ornaments	0	0.00	1	100.00	0	0.00	1	0.56
- Pharmaceutical Products and Cosmetics	1	50.00	0	0.00	1	50.00	2	1.13
- Textiles, Clothing and Footwear (Fashion)	4	33.33	6	50.00	2	16.67	12	6.78
Industrials	**18**	**17.31**	**9**	**18.00**	**5**	**21.74**	**32**	**18.08**
- Chemicals and Plastics (Petrochemical &Chemical)	7	63.64	3	27.27	1	9.09	11	6.21
- Machinery and Equipment	0	0.00	1	50.00	1	50.00	2	1.13
- Packaging	5	50.00	2	20.00	3	30.00	10	5.65
- Pulp and Paper (Paper and Printing Materials)	1	50.00	1	50.00	0	0.00	2	1.13
- Vehicles and Parts (Automotive)	5	71.43	2	28.57	0	0.00	7	3.95
Property and Constructions	**23**	**22.12**	**10**	**20.00**	**4**	**17.39**	**37**	**20.90**
- Building and Furnishing Materials (Construction Materials)	8	47.06	6	35.29	3	17.65	17	9.60
- Property Development	15	75.00	4	20.00	1	5.00	20	11.30
Resources	**4**	**3.85**	**1**	**2.00**	**1**	**4.35**	**6**	**3.39**
- Energy (Energy & utilities)	2	66.67	0	0.00	1	33.33	3	1.69
- Mining	2	66.67	1	33.33	0	0.00	3	1.69
Services	**31**	**29.81**	**3**	**6.00**	**3**	**13.04**	**37**	**20.90**
- Commerce	11	91.67	1	8.33	0	0.00	12	6.78
- Entertainment and Recreation (Entertainment)	2	40.00	0	0.00	3	60.00	5	2.82
- Health Care Services	2	100.00	0	0.00	0	0.00	2	1.13
- Hotels and Travel Services	7	100.00	0	0.00	0	0.00	7	3.95
- Printing and Publishing	3	100.00	0	0.00	0	0.00	3	1.69
- Professional Services	0	0.00	1	100.00	0	0.00	1	0.56
- Transportation (Transportation & Logistics)	4	80.00	1	20.00	0	0.00	5	2.82

Table 5.3 (Continued)

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
- Warehouse and Silo	2	100.00	0	0.00	0	0.00	2	1.13
Technology	**7**	**6.73**	**7**	**14.00**	**1**	**4.35**	**15**	**8.47**
- Communication	6	100.00	0	0.00	0	0.00	6	3.39
- Electrical Products and Computer	1	20.00	3	60.00	1	20.00	5	2.82
- Electronic Components	0	0.00	4	100.00	0	0.00	4	2.26
Others	**4**	**3.85**	**0**	**0.00**	**1**	**4.35**	**5**	**2.82**
- Others	4	80.00	0	0.00	1	20.00	5	2.82
Totals	**104**	**58.76**	**50**	**28.25**	**23**	**12.99**	**177**	**100.00**

Panel H: Year 1998

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Agro & Food Industry	**13**	**13.68**	**11**	**23.40**	**3**	**15.00**	**27**	**16.67**
- Agribusiness	8	50.00	6	37.50	2	12.50	16	9.88
- Food and Beverage	5	45.45	5	45.45	1	9.09	11	6.79
Consumer Products	**4**	**4.21**	**10**	**21.28**	**4**	**20.00**	**18**	**11.11**
- Household Goods	0	0.00	3	60.00	2	40.00	5	3.09
- Jewelry and Ornaments	0	0.00	1	100.00	0	0.00	1	0.62
- Pharmaceutical Products and Cosmetics	1	50.00	0	0.00	1	50.00	2	1.23
- Textiles, Clothing and Footwear (Fashion)	3	30.00	6	60.00	1	10.00	10	6.17
Industrials	**13**	**13.68**	**9**	**19.15**	**6**	**30.00**	**28**	**17.28**
- Chemicals and Plastics (Petrochemical &Chemical)	4	57.14	2	28.57	1	14.29	7	4.32
- Machinery and Equipment	0	0.00	1	50.00	1	50.00	2	1.23
- Packaging	4	40.00	3	30.00	3	30.00	10	6.17
- Pulp and Paper (Paper and Printing Materials)	1	50.00	1	50.00	0	0.00	2	1.23
- Vehicles and Parts (Automotive)	4	57.14	2	28.57	1	14.29	7	4.32

Table 5.3 (Continued)

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Property and Constructions	**18**	**18.95**	**9**	**19.15**	**3**	**15.00**	**30**	**18.52**
- Building and Furnishing Materials (Construction Materials)	5	41.67	5	41.67	2	16.67	12	7.41
- Property Development	13	72.22	4	22.22	1	5.56	18	11.11
Resources	**3**	**3.16**	**0**	**0.00**	**0**	**0.00**	**3**	**1.85**
- Energy (Energy & utilities)	2	100.00	0	0.00	0	0.00	2	1.23
- Mining	1	100.00	0	0.00	0	0.00	1	0.62
Services	**32**	**33.68**	**2**	**4.26**	**2**	**10.00**	**36**	**22.22**
- Commerce	13	100.00	0	0.00	0	0.00	13	8.02
- Entertainment and Recreation (Entertainment)	4	66.67	0	0.00	2	33.33	6	3.70
- Health Care Services	1	100.00	0	0.00	0	0.00	1	0.62
- Hotels and Travel Services	6	100.00	0	0.00	0	0.00	6	3.70
- Printing and Publishing	3	100.00	0	0.00	0	0.00	3	1.85
- Professional Services	0	0.00	1	100.00	0	0.00	1	0.62
- Transportation (Transportation & Logistics)	4	80.00	1	20.00	0	0.00	5	3.09
- Warehouse and Silo	1	100.00	0	0.00	0	0.00	1	0.62
Technology	**8**	**8.42**	**6**	**12.77**	**1**	**5.00**	**15**	**9.26**
- Communication	6	100.00	0	0.00	0	0.00	6	3.70
- Electrical Products and Computer	2	33.33	3	50.00	1	16.67	6	3.70
- Electronic Components	0	0.00	3	100.00	0	0.00	3	1.85
Others	**4**	**4.21**	**0**	**0.00**	**1**	**5.00**	**5**	**3.09**
- Others	4	80.00	0	0.00	1	20.00	5	3.09
Totals	**95**	**58.64**	**47**	**29.01**	**20**	**12.35**	**162**	**100.00**

Table 5.3 (Continued)

Panel I: Year 1997

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Agro & Food Industry	**13**	**14.44**	**9**	**18.75**	**2**	**10.00**	**24**	**15.19**
- Agribusiness	8	57.14	4	28.57	2	14.29	14	8.86
- Food and Beverage	5	50.00	5	50.00	0	0.00	10	6.33
Consumer Products	**4**	**4.44**	**13**	**27.08**	**4**	**20.00**	**21**	**13.29**
- Household Goods	1	20.00	3	60.00	1	20.00	5	3.16
- Jewelry and Ornaments	1	33.33	2	66.67	0	0.00	3	1.90
- Pharmaceutical Products and Cosmetics	0	0.00	0	0.00	1	100.00	1	0.63
- Textiles, Clothing and Footwear (Fashion)	2	16.67	8	66.67	2	16.67	12	7.59
Industrials	**11**	**12.22**	**5**	**10.42**	**6**	**30.00**	**22**	**13.92**
- Chemicals and Plastics (Petrochemical &Chemical)	4	66.67	1	16.67	1	16.67	6	3.80
- Machinery and Equipment	0	0.00	1	50.00	1	50.00	2	1.27
- Packaging	3	33.33	3	33.33	3	33.33	9	5.70
- Pulp and Paper (Paper and Printing Materials)	1	100.00	0	0.00	0	0.00	1	0.63
- Vehicles and Parts (Automotive)	3	75.00	0	0.00	1	25.00	4	2.53
Property and Constructions	**20**	**22.22**	**7**	**14.58**	**6**	**30.00**	**33**	**20.89**
- Building and Furnishing Materials (Construction Materials)	7	46.67	5	33.33	3	20.00	15	9.49
- Property Development	13	72.22	2	11.11	3	16.67	18	11.39
Resources	**4**	**4.44**	**0**	**0.00**	**0**	**0.00**	**4**	**2.53**
- Energy (Energy & utilities)	2	100.00	0	0.00	0	0.00	2	1.27
- Mining	2	100.00	0	0.00	0	0.00	2	1.27
Services	**26**	**28.89**	**6**	**12.50**	**0**	**0.00**	**32**	**20.25**
- Commerce	8	66.67	4	33.33	0	0.00	12	7.59
- Entertainment and Recreation (Entertainment)	4	80.00	1	20.00	0	0.00	5	3.16
- Health Care Services	1	100.00	0	0.00	0	0.00	1	0.63
- Hotels and Travel Services	6	100.00	0	0.00	0	0.00	6	3.80
- Printing and Publishing	2	100.00	0	0.00	0	0.00	2	1.27
- Professional Services	0	0.00	0	0.00	0	0.00	0	0.00
- Transportation (Transportation & Logistics)	4	80.00	1	20.00	0	0.00	5	3.16

Table 5.3 (Continued)

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
- Warehouse and Silo	1	100.00	0	0.00	0	0.00	1	0.63
Technology	**9**	**10.00**	**8**	**16.67**	**1**	**5.00**	**18**	**11.39**
- Communication	6	100.00	0	0.00	0	0.00	6	3.80
- Electrical Products and Computer	3	33.33	5	55.56	1	11.11	9	5.70
- Electronic Components	0	0.00	3	100.00	0	0.00	3	1.90
Others	**3**	**3.33**	**0**	**0.00**	**1**	**5.00**	**4**	**2.53**
- Others	3	75.00	0	0.00	1	25.00	4	2.53
Totals	**90**	56.96	**48**	30.38	**20**	12.66	**158**	100.00

Panel J: Year 1996

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Agro & Food Industry	**11**	**14.10**	**10**	**23.26**	**1**	**6.25**	**22**	**16.06**
- Agribusiness	6	54.55	4	36.36	1	9.09	11	8.03
- Food and Beverage	5	45.45	6	54.55	0	0.00	11	8.03
Consumer Products	**3**	**3.85**	**11**	**25.58**	**4**	**25.00**	**18**	**13.14**
- Household Goods	2	33.33	3	50.00	1	16.67	6	4.38
- Jewelry and Ornaments	1	33.33	2	66.67	0	0.00	3	2.19
- Pharmaceutical Products and Cosmetics	0	0.00	0	0.00	1	100.00	1	0.73
- Textiles, Clothing and Footwear (Fashion)	0	0.00	6	75.00	2	25.00	8	5.84
Industrials	**11**	**14.10**	**3**	**6.98**	**5**	**31.25**	**19**	**13.87**
- Chemicals and Plastics (Petrochemical &Chemical)	4	66.67	1	16.67	1	16.67	6	4.38
- Machinery and Equipment	0	0.00	0	0.00	1	100.00	1	0.73
- Packaging	3	42.86	2	28.57	2	28.57	7	5.11
- Pulp and Paper (Paper and Printing Materials)	1	100.00	0	0.00	0	0.00	1	0.73

Table 5.3 (Continued)

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
- Vehicles and Parts (Automotive)	3	75.00	0	0.00	1	25.00	4	2.92
Property and Constructions	**21**	**26.92**	**5**	**11.63**	**5**	**31.25**	**31**	**22.63**
- Building and Furnishing Materials (Construction Materials)	6	50.00	3	25.00	3	25.00	12	8.76
- Property Development	15	78.95	2	10.53	2	10.53	19	13.87
Resources	**3**	**3.85**	**0**	**0.00**	**0**	**0.00**	**3**	**2.19**
- Energy (Energy & utilities)	2	100.00	0	0.00	0	0.00	2	1.46
- Mining	1	100.00	0	0.00	0	0.00	1	0.73
Services	**20**	**25.64**	**5**	**11.63**	**0**	**0.00**	**25**	**18.25**
- Commerce	6	60.00	4	40.00	0	0.00	10	7.30
- Entertainment and Recreation (Entertainment)	3	100.00	0	0.00	0	0.00	3	2.19
- Health Care Services	0	0.00	0	0.00	0	0.00	0	0.00
- Hotels and Travel Services	5	100.00	0	0.00	0	0.00	5	3.65
- Printing and Publishing	2	100.00	0	0.00	0	0.00	2	1.46
- Professional Services	0	0.00	0	0.00	0	0.00	0	0.00
- Transportation (Transportation & Logistics)	4	80.00	1	20.00	0	0.00	5	3.65
- Warehouse and Silo	0	0.00	0	0.00	0	0.00	0	0.00
Technology	**7**	**8.97**	**8**	**18.60**	**1**	**6.25**	**16**	**11.68**
- Communication	5	100.00	0	0.00	0	0.00	5	3.65
- Electrical Products and Computer	2	28.57	4	57.14	1	14.29	7	5.11
- Electronic Components	0	0.00	4	100.00	0	0.00	4	2.92
Others	**2**	**2.56**	**1**	**2.33**	**0**	**0.00**	**3**	**2.19**
- Others	2	66.67	1	33.33	0	0.00	3	2.19
Totals	**78**	**56.93**	**43**	**31.39**	**16**	**11.68**	**137**	**100.00**

Table 5.3 (Continued)

Panel K: Year 1995

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Agro & Food Industry	**9**	**14.29**	**6**	**23.08**	**2**	**12.50**	**17**	**16.19**
- Agribusiness	7	63.64	2	18.18	2	18.18	11	10.48
- Food and Beverage	2	33.33	4	66.67	0	0.00	6	5.71
Consumer Products	**3**	**4.76**	**6**	**23.08**	**3**	**18.75**	**12**	**11.43**
- Household Goods	1	25.00	2	50.00	1	25.00	4	3.81
- Jewelry and Ornaments	0	0.00	2	100.00	0	0.00	2	1.90
- Pharmaceutical Products and Cosmetics	0	0.00	0	0.00	1	100.00	1	0.95
- Textiles, Clothing and Footwear (Fashion)	2	40.00	2	40.00	1	20.00	5	4.76
Industrials	**10**	**15.87**	**4**	**15.38**	**4**	**25.00**	**18**	**17.14**
- Chemicals and Plastics (Petrochemical &Chemical)	4	66.67	1	16.67	1	16.67	6	5.71
- Machinery and Equipment	1	100.00	0	0.00	0	0.00	1	0.95
- Packaging	3	42.86	2	28.57	2	28.57	7	6.67
- Pulp and Paper (Paper and Printing Materials)	0	0.00	1	100.00	0	0.00	1	0.95
- Vehicles and Parts (Automotive)	2	66.67	0	0.00	1	33.33	3	2.86
Property and Constructions	**14**	**22.22**	**3**	**11.54**	**5**	**31.25**	**22**	**20.95**
- Building and Furnishing Materials (Construction Materials)	4	50.00	1	12.50	3	37.50	8	7.62
- Property Development	10	71.43	2	14.29	2	14.29	14	13.33
Resources	**3**	**4.76**	**0**	**0.00**	**0**	**0.00**	**3**	**2.86**
- Energy (Energy & utilities)	1	100.00	0	0.00	0	0.00	1	0.95
- Mining	2	100.00	0	0.00	0	0.00	2	1.90
Services	**15**	**23.81**	**1**	**3.85**	**1**	**6.25**	**17**	**16.19**
- Commerce	4	80.00	0	0.00	1	20.00	5	4.76
- Entertainment and Recreation (Entertainment)	1	100.00	0	0.00	0	0.00	1	0.95
- Health Care Services	0	0.00	0	0.00	0	0.00	0	0.00
- Hotels and Travel Services	5	100.00	0	0.00	0	0.00	5	4.76
- Printing and Publishing	2	100.00	0	0.00	0	0.00	2	1.90
- Professional Services	0	0.00	0	0.00	0	0.00	0	0.00
- Transportation (Transportation & Logistics)	3	75.00	1	25.00	0	0.00	4	3.81

Table 5.3 (Continued)

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
- Warehouse and Silo	0	0.00	0	0.00	0	0.00	0	0.00
Technology	**7**	**11.11**	**6**	**23.08**	**1**	**6.25**	**14**	**13.33**
- Communication	5	100.00	0	0.00	0	0.00	5	4.76
- Electrical Products and Computer	2	28.57	4	57.14	1	14.29	7	6.67
- Electronic Components	0	0.00	2	100.00	0	0.00	2	1.90
Others	**2**	**3.17**	**0**	**0.00**	**0**	**0.00**	**2**	**1.90**
- Others	2	100.00	0	0.00	0	0.00	2	1.90
Totals	**63**	**60.00**	**26**	**24.76**	**16**	**15.24**	**105**	**100.00**

Panel L: Year 1994

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Agro & Food Industry	**5**	**14.29**	**2**	**10.53**	**1**	**9.09**	**8**	**12.31**
- Agribusiness	5	62.50	2	25.00	1	12.50	8	12.31
- Food and Beverage	0	0.00	0	0.00	0	0.00	0	0.00
Consumer Products	**0**	**0.00**	**4**	**21.05**	**3**	**27.27**	**7**	**10.77**
- Household Goods	0	0.00	2	66.67	1	33.33	3	4.62
- Jewelry and Ornaments	0	0.00	1	100.00	0	0.00	1	1.54
- Pharmaceutical Products and Cosmetics	0	0.00	0	0.00	1	100.00	1	1.54
- Textiles, Clothing and Footwear (Fashion)	0	0.00	1	50.00	1	50.00	2	3.08
Industrials	**6**	**17.14**	**5**	**26.32**	**3**	**27.27**	**14**	**21.54**
- Chemicals and Plastics (Petrochemical &Chemical)	3	50.00	2	33.33	1	16.67	6	9.23
- Machinery and Equipment	0	0.00	0	0.00	0	0.00	0	0.00
- Packaging	3	42.86	2	28.57	2	28.57	7	10.77
- Pulp and Paper (Paper and Printing Materials)	0	0.00	0	0.00	0	0.00	0	0.00
- Vehicles and Parts (Automotive)	0	0.00	1	100.00	0	0.00	1	1.54

Table 5.3 (Continued)

Industry	Total Listed Companies (Final Sample Size)							
	Industry/ Line-of-business Format		Geographical Format		Both Industry and Geographical Format		Totals	
	(Firms)	%	(Firms)	%	(Firms)	%	(Firms)	%
Property and Constructions	**11**	**31.43**	**2**	**10.53**	**4**	**36.36**	**17**	**26.15**
- Building and Furnishing Materials (Construction Materials)	4	57.14	1	14.29	2	28.57	7	10.77
- Property Development	7	70.00	1	10.00	2	20.00	10	15.38
Resources	**3**	**8.57**	**0**	**0.00**	**0**	**0.00**	**3**	**4.62**
- Energy (Energy & utilities)	1	100.00	0	0.00	0	0.00	1	1.54
- Mining	2	100.00	0	0.00	0	0.00	2	3.08
Services	**6**	**17.14**	**1**	**5.26**	**0**	**0.00**	**7**	**10.77**
- Commerce	0	0.00	0	0.00	0	0.00	0	0.00
- Entertainment and Recreation (Entertainment)	0	0.00	0	0.00	0	0.00	0	0.00
- Health Care Services	0	0.00	0	0.00	0	0.00	0	0.00
- Hotels and Travel Services	5	100.00	0	0.00	0	0.00	5	7.69
- Printing and Publishing	0	0.00	0	0.00	0	0.00	0	0.00
- Professional Services	0	0.00	0	0.00	0	0.00	0	0.00
- Transportation (Transportation & Logistics)	1	50.00	1	50.00	0	0.00	2	3.08
- Warehouse and Silo	0	0.00	0	0.00	0	0.00	0	0.00
Technology	**4**	**11.43**	**5**	**26.32**	**0**	**0.00**	**9**	**13.85**
- Communication	4	100.00	0	0.00	0	0.00	4	6.15
- Electrical Products and Computer	0	0.00	3	100.00	0	0.00	3	4.62
- Electronic Components	0	0.00	2	100.00	0	0.00	2	3.08
Others	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**
- Others	0	0.00	0	0.00	0	0.00	0	0.00
Totals	**35**	**53.85**	**19**	**29.23**	**11**	**16.92**	**65**	**100.00**

Notes: - The percentage figures in bold for each column and each panel are calculated by using the number of listed companies presenting segment reporting information in individual format (i.e. industry/line-of business format, geographical format or both in each industry groups) divided by totals listed companies presenting segment reporting as such format.

Table 5.3 (Continued)

- The non-bold percentage figures in each column and each panel are calculated by using the number of listed companies presenting segment reporting in individual format (i.e. industry/line-of business format, geographical format or both in each industry groups) divided by totals listed companies in each sector of industry groups.

To provide a clear picture of the frequency of firms disclosing multi-segments in each of the industry groups, this study also depicts the percentages of those multi-segment firms in Figure 5.2.

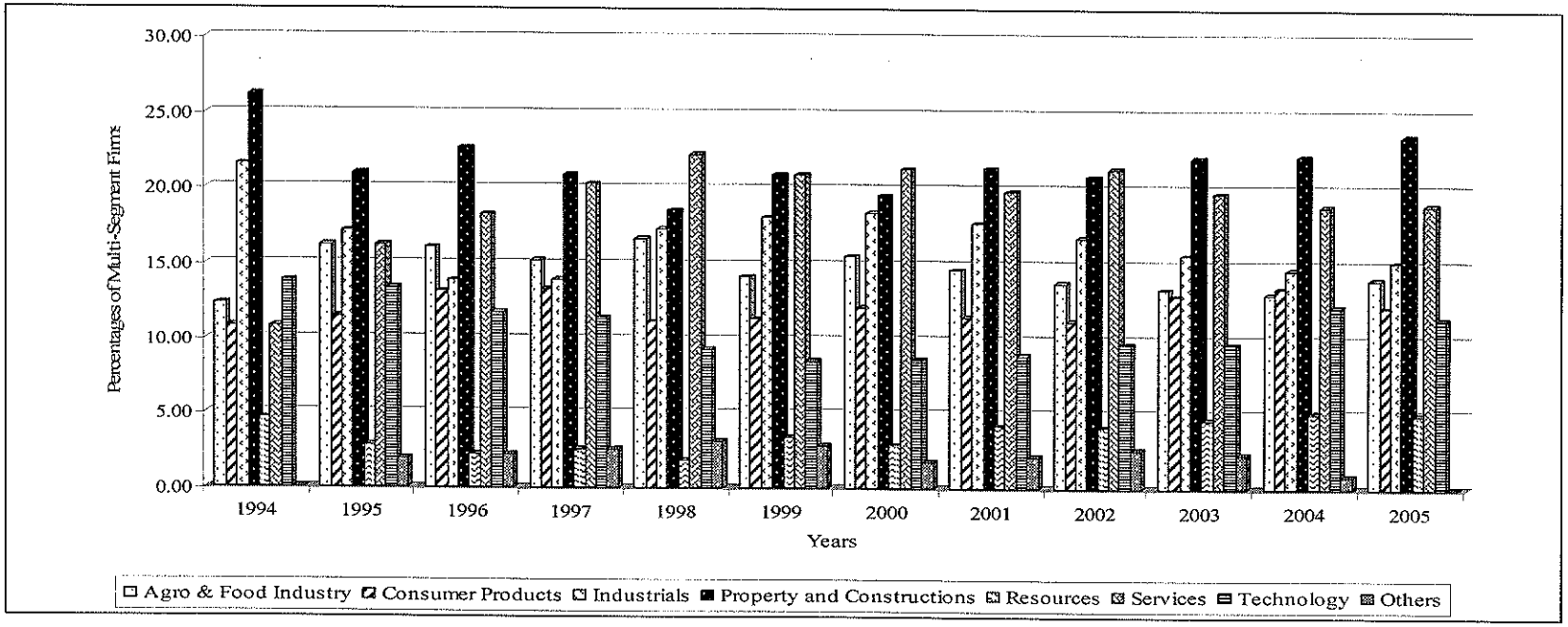

Figure 5.2 The Percentages of Multi-Segment Firms (Excluding Firm Disclosing as Company Group) Based on Each Industry of SET

Source: Table 5.3.

Notes: 1 Percentages of multi-segment firms = Numbers of firms disclosing multi-segment information (excluding firms disclosing as company group) in each industry divided by total firms disclose multi-segment information (excluding firms disclosing as company group) in each year and multiplied by 100.

2 Companies under rehabilitation are reclassified into their original industries.

Table 5.3 and Figure 5.2 show that firms in the property and construction industry always revealed their multi-segment information as a topic in the notes of their financial statements. Specifically, 9 of 12 years (1994, 1995, 1996, 1997, 1999, 2001 2003, 2004, and 2005) show the highest percentages of firms in this industry that reported multi-segment information when compared with other industries. Among those years, firms in the building and furnishing materials (construction materials) sector favored disclosing segment information by geographical segments in the year 2003-2005, while they prefer to disclose segment reporting by industry/line of business before the year 2003. In contrast, firms in the property development sector always preferred to disclose using the industry/line-of business format.

Table 5.3 and Figure 5.2 also describe that firms in the service industry have the highest percentages of firms that revealed multi-segment information; with 4 of 12 years (1998, 1999, 2000 and 2002); specifically, firms in commerce sector always used the industry or line of business format to present segment information.

Furthermore, this study illustrates the percentages of firms disclosing segment information for the different formats used in reporting segment information based on industry groups defined by the SET. This industry grouping is done by dividing the firms into industry/line-of-business format, geographical format and a mix of geographic area and business format as shown in Figure 5.3, 5.4, and 5.5, respectively.

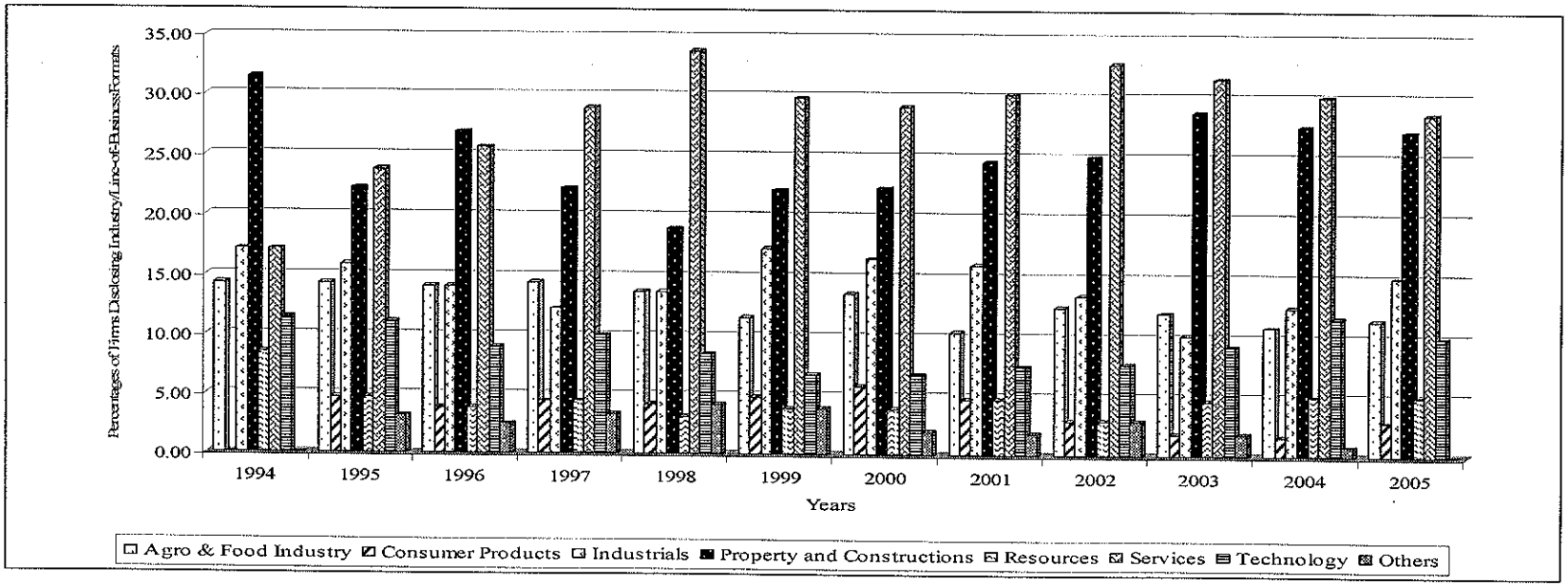

Figure 5.3 The Percentages of Firms Disclosing Segmental Information by Using Only Industry/Line-of-Business Format Based on Each Industry of SET

Source: Table 5.3.

Notes: 1 Percentages of firms disclosing industry/line-of-business format = Numbers of firms disclosing multi-segment information as industry/line-of-business format in each industry divided by total firms disclosing segment information as industry/line-of-business format in each year and multiplied by 100.

2 Companies under rehabilitation are reclassified into their original industries.

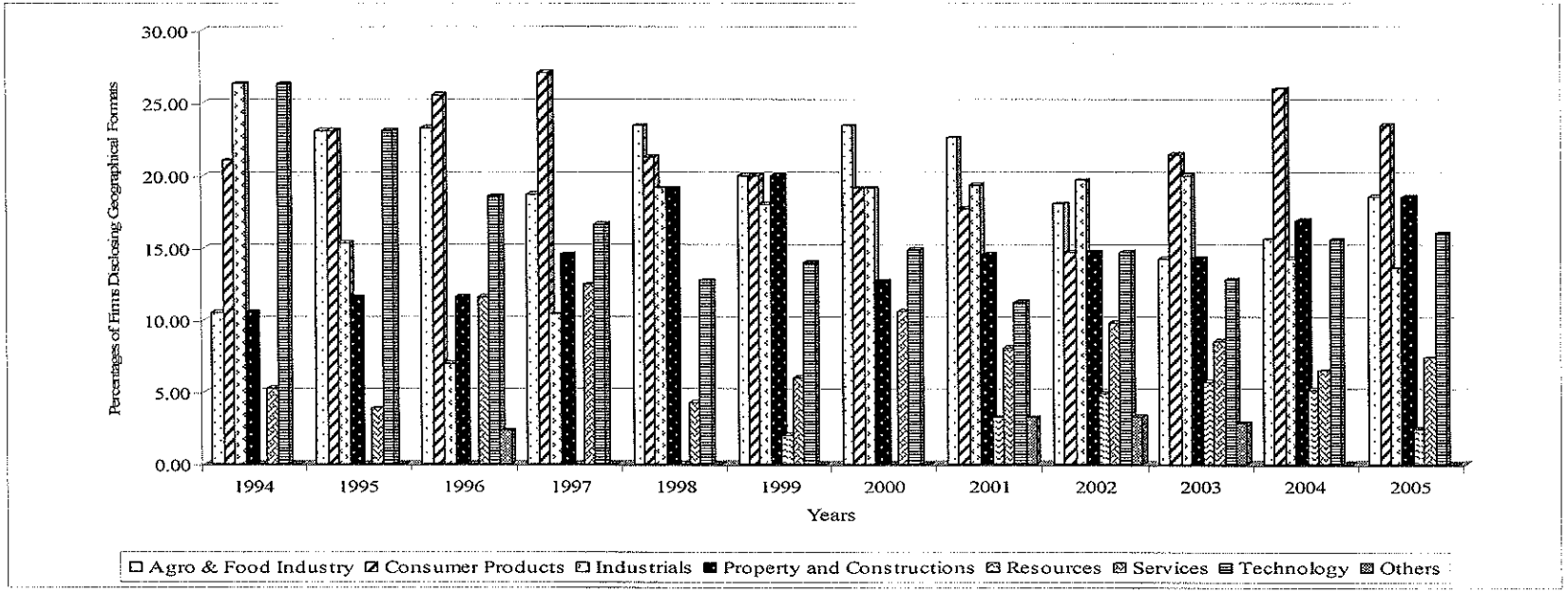

Figure 5.4 The Percentages of Firms Disclosing Segmental Information by Using Only the Geographical Format Based on Each Industry of SET

Source: Table 5.3.

Notes: 1 Percentages of firms disclosing geographical formats = Numbers of firms disclosing multi-segment information as geographical format in each industry divided by total firms disclosing segment information as geographical format in each year and multiplied by 100.

2 Companies under rehabilitation are reclassified into their original industries.

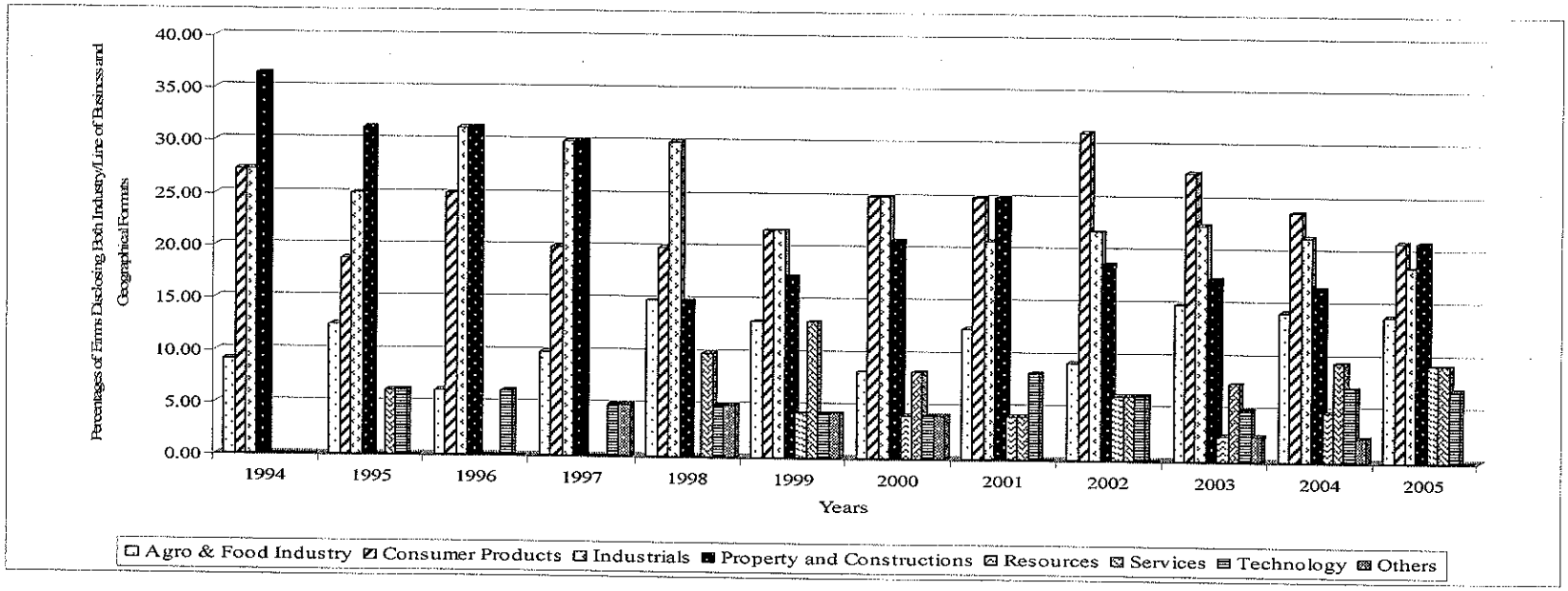

Figure 5.5 The Percentages of Firms Disclosing Segmental Information by Using Both Industry/Line-of-Business and Geographical Format Based on Each Industry of SET

Source: Table 5.3.

Notes: 1 Percentages of firms disclosing both industry/line of business and geographical format = Numbers of firms disclosing multi-segment information as both industry/line-of-business and geographical format in each industry divided by total firms disclosing segment information as both industry/line-of business and geographical format in each year and multiplied by 100.

2 Companies under rehabilitation are reclassified into their original industries.

Table 5.3 and Figure 5.3 show that firms in the service industry favor disclosing segment information by industry/line-of-business format among 10 of the 12 years (1995, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, and 2005), while firms in property and construction industry prefer to disclose segments by industry/line-of-business among 2 of the 12 years (1994 and 1996). To be exact, most firms in the commerce sector and property development sector always chose the industry/line-of-business format to present segment information. Note that since 2002, most firms in the entertainment and recreation sector also chose the industry/line-of-business format as the segment reporting method. One reason is that since 2002 firms in such sectors may have experienced high growth or expanded various businesses.

Table 5.3 and Figure 5.4 indicate that firms in the consumer product industry prefer to disclose segment information by using only the geographical format, among 7 of the 12 years (1995, 1996, 1997, 1999, 2003, 2004, and 2005), while those in the agro and food industry favored revealing segments by geographical areas among 5 of the 12 years (1995, 1998, 1999, 2000, and 2001). In particular, firms in the textiles, clothing and footwear (fashion) sector always used geographical segments to present segment reporting information. In contrast, among firms disclosing segment information by geographical areas in the agro and food industry, the number of firms in the agribusiness sector was similar to that in the food and beverage sector.

Table 5.3 and Figure 5.5 show that firms in the property and construction industry always prefer to reveal segments by using a mix of geographic area and business format; in 1994, 1995, 1996, 1997, 2001, and 2005, specifically, firms in the building and furnishing materials (construction materials) sector. Firms in the industrial industry also favored presenting segment information by using a mix of geographic area and business formats, as indicated in 1996, 1997, 1998, 1999, and 2000. Firms in the consumer products industry have the highest percentages of firms disclosing segments by a mix of geographic area and business format; in 1999, 2000, 2001, 2002, 2003, 2004, and 2005, specifically, firms in textiles, clothing and footwear (fashion).

In conclusion, the identification of segments depends on the nature of business operations. For example, if firms are involved in the export business (e.g. agribusiness, industrial, textiles, clothing, and footwear, etc.), they possibly choose

geographical segments to present their operations. In addition to the nature and the distribution of segment identification of firms in each industry, there is an important question concerning the extent of geographic segment information disclosed.

With respect to geographic segment disclosures, TAS No.24 defines "geographical segments" as the distinguishable components of an enterprise engaged in operations in individual countries or groups of countries within particular geographical areas as may be determined to be appropriate in an enterprise's particular circumstances. The results of how listed companies reporting geographical segments are presented in Table 5.4.

Table 5.4 The Nature of Geographic Reportable Segments

Year	In Country/In Foreign Countries	Specific Geographic Continent Basis[1]	Specific Geographic Countries	Specific City in Thailand (Bangkok/ other Cities)	Totals[2]
1994	28	0	1	1	**30**
1995	39	0	2	1	**42**
1996	51	2	3	3	**59**
1997	58	3	4	3	**68**
1998	61	1	4	1	**67**
1999	65	2	4	2	**73**
2000	62	1	6	2	**71**
2001	75	2	7	2	**86**
2002	76	6	9	2	**93**
2003	92	8	7	3	**110**
2004	99	9	8	3	**119**
2005	101	11	9	3	**124**

Notes: 1 Specific geographic continent basis includes firms identifying segments with a hybrid of Thailand and other continents.

2 The data in Table 5.4 combines the number of firms which report segment information using geographical formats and that of firms which report based on a mix of geographic area and business format.

The findings in Table 5.4 report that few listed companies (approximately 10 percent) identify their segments in the individual countries or groups of countries within particular geographical areas, while most listed companies (82 percent in 2005) disclose geographical segments broadly as “in countries/Thailand” and “in foreign countries”. This result implies that the identification of geographical segments of Thai listed companies reflects inadequately, the scope of international operations. It is possible that the operation in each specific country is not considered “material” because the size of business is less than the ten percent threshold.

Paragraph 14 of the TAS No.24 provides general guidelines that state that the materiality of the segment could based on ten percent of consolidated revenue, operating profit or total assets. Allowing management to exercise its judgment to choose its ten percent threshold increases flexibility but it could result in the inconsistency in segmental disclosures among firms in the same industries.

In addition, paragraph 10 of the TAS No.24 explains that a firm could disclose domestic sales and foreign sales separately. This leads some firms to minimally disclose geographical segment such as “in country/ Thailand” and “in foreign countries” rather than disclose sales in each individual country. The other possible explanation for such a broad disclosure is that managers may want to avoid releasing crucial competitive information (i.e. market or production locations) to the public including competitors. It is questionable that identifying broad geographic areas would make segmental information less meaningful to the financial statement users.

The findings of Table 5.4 also reveal that some companies (about 2 percent in 2005) still reported geographical segments as individual cities in Thailand, while paragraph 10 of the TAS No.24 explains that an enterprise’s domestic operations are generally considered to be a separate geographical segment. This empirical evidence implies that those listed companies tried to apply the accounting standard with their operations, so they voluntarily disclose more details about their domestic operations.

This study further analyzes the question of what types of accounting information provided in segment reporting. The empirical results are described in Table 5.5, Panel A, B, and C depending on each reportable format (i.e. industry/line-of-business format, geographical format, and both, respectively)

Table 5.5 Number of Companies Disclosing Specific Items of Segment Information Comparison of Disclosures under TAS

Panel A: Firms Use Industry/Line-of-Business Format

Item Discloses	1994 (N=35)	1995 (N=63)	1996 (N=78)	1997 (N=90)	1998 (N=95)	1999 (N=104)	2000 (N=103)	2001 (N=106)	2002 (N=104)	2003 (N=108)	2004 (N=120)	2005 (N=140)
Items required Under TAS No. 24												
(a) Sales or Revenues	35	62	78	90	95	104	103	106	104	108	120	139
(b) Segment Results	34	62	76	83	88	96	96	100	96	101	109	128
(c) Segment Assets Amount (%, Baht)	28	46	56	61	66	80	75	75	72	73	80	99
Voluntary Disclosures												
- Items required under TAS No. 50												
(d) Liabilities	0	0	0	0	0	4	5	6	8	9	10	20
(e) Cost of acquire property, plant, equipment, and intangibles	1	1	1	1	1	0	1	2	2	2	2	8
(f) Depreciation	2	2	3	3	3	5	7	9	7	7	10	17
(g) Other non-cash items	0	0	0	0	0	3	5	7	6	7	1	10
(h) Equity method income	0	1	3	5	9	9	9	9	6	10	8	11
(i) Encouraged disclosure cash flow	0	0	0	0	0	1	1	1	2	1	1	2
- Other commonly disclosed items												
(j) Tax	2	4	6	4	7	7	8	12	9	7	10	16
(k) Interests	3	7	9	8	10	13	13	14	12	9	14	20
(l) Account Receivable	0	4	5	6	7	5	1	2	6	5	3	9
(m) Inventory	0	2	3	5	6	5	1	4	6	6	4	8
(n) Other[1]	11	24	32	34	37	46	44	46	58	47	51	73

Table 5.5: (Continued)

Panel B: Firms Use Geographical Format

Item Discloses	1994 (N=19)	1995 (N=26)	1996 (N=43)	1997 (N=48)	1998 (N=47)	1999 (N=50)	2000 (N=47)	2001 (N=62)	2002 (N=61)	2003 (N=70)	2004 (N=77)	2005 (N=81)
Items required Under TAS No. 24												
(a) Sales or Revenues	18	25	42	48	47	50	47	62	61	70	77	81
(b) Segment Results	11	19	25	27	30	30	30	35	37	40	45	42
(c) Segment Assets Amount (%, Baht)	8	14	12	12	13	12	11	14	16	19	19	23
Voluntary Disclosures												
- Items required under TAS No..50												
(d) Liabilities	0	0	0	0	0	1	0	0	1	1	0	1
(e) Cost of acquire property, plant, equipment, and intangibles	0	0	0	0	0	0	0	0	0	0	1	1
(f) Depreciation	0	0	0	0	0	1	0	0	0	0	0	0
(g) Other non-cash items	0	0	0	0	1	2	1	2	1	1	0	1
(h) Equity method income	1	0	0	0	1	4	1	4	2	2	2	2
(i) Encouraged disclosure cash flow	0	0	0	0	0	0	0	0	1	0	0	0
- Other commonly disclosed items												
(j) Tax	1	3	2	1	2	4	4	2	4	3	2	4
(k) Interests	2	3	2	4	5	6	3	3	4	3	2	5
(l) Account Receivable	1	3	2	4	6	6	5	2	5	7	11	11
(m) Inventory	0	0	0	0	0	0	0	1	1	3	4	3
(n) Other[1]	7	7	5	9	11	16	13	16	15	16	17	18

Table 5.5 (Continued)

Panel C: Firms Use Both Industry/Line of Business and Geographical Format

Item Discloses	1994 (N=11)		1995 (N=16)		1996 (N=16)		1997 (N=20)		1998 (N=20)		1999 (N=23)	
	MG	ML	MG	ML	MG	ML	MG	ML	MG	ML	MG	ML
Items required Under TAS No. 24												
(a) Sales or Revenues	11	10	16	15	16	15	20	19	20	20	23	23
(b) Segment Results	6	10	9	14	8	15	14	18	10	17	6	10
(c) Segment Assets Amount (%, Baht)	4	9	5	10	4	9	6	13	4	11	4	12
Voluntary Disclosures												
- Items required under TAS No. 50												
(d) Liabilities	0	0	0	0	0	0	0	0	0	0	0	0
(e) Cost of acquire property, plant, equipment, and intangibles	0	0	0	0	0	0	0	0	0	0	0	0
(f) Depreciation	0	0	0	0	0	0	0	0	0	0	0	0
(g) Other non-cash items	0	0	0	0	0	0	1	1	1	1	0	0
(h) Equity method income	0	0	0	1	0	3	1	4	2	4	0	2
(i) Encouraged disclosure cash flow	0	0	0	0	0	0	0	0	0	0	0	0
- Other commonly disclosed items												
(j)Tax	0	1	0	2	0	2	1	2	2	2	0	2
(k) Interests	0	1	0	2	0	3	1	4	2	4	0	2
(l) Account Receivable	1	1	1	2	1	1	1	1	1	2	1	2
(m) Inventory	1	1	1	1	1	1	1	1	1	1	1	1
(n) Other[1]	3	7	1	5	2	6	5	9	3	9	2	7

Table 5.5 (Continued)

Item Discloses	2000 (N=24)		2001 (N=24)		2002 (N=32)		2003 (N=40)		2004 (N=42)		2005 (N=43)	
	MG	ML	MG	ML	MG	ML	MG	ML	MG	ML	MG	ML
Items required Under TAS No. 24												
(a) Sales or Revenues	24	24	24	24	32	32	36	40	42	42	43	43
(b) Segment Results	10	17	9	17	12	24	17	29	20	32	18	32
(c) Segment Assets Amount (%, Baht)	5	15	7	17	10	23	11	30	14	32	14	30
Voluntary Disclosures												
- Items required under TAS No. 50												
(d) Liabilities	1	1	1	1	1	2	2	4	3	5	3	5
(e) Cost of acquire property, plant, equipment, and intangibles	0	0	0	0	0	0	1	1	1	1	1	1
(f) Depreciation	1	1	1	1	2	3	2	3	2	3	2	4
(g) Other non-cash items	2	2	2	2	2	2	1	2	1	2	1	2
(h) Equity method income	2	3	2	3	2	4	4	6	4	5	3	3
(i) Encouraged disclosure cash flow	0	0	0	0	0	0	0	0	0	0	0	0
- Others												
(j)Tax	2	4	2	4	2	5	5	7	4	6	4	5
(k) Interests	2	3	2	3	2	4	4	6	3	5	3	4
(l) Account Receivable	1	1	2	1	2	1	2	2	4	4	4	3
(m) Inventory	1	2	2	2	2	2	2	3	3	5	4	5
(n) Other[1]	8	15	8	14	10	18	8	18	8	19	9	21

Notes: 1 Other voluntary disclosures include other asset, other revenue, other expense.

Definitions: ML: multiple line-of-business or industry segments in the notes of financial statements; and MG: multiple geographical segments in the notes of financial statements.

Panel A of Table 5.5 describes that, as required by TAS No.24, all the companies which presented segments by using the industry/line-of-business format, except one company in 1995 and 2005, disclosed segment sales or revenues. The majority of firms disclosed a measure of segment profit and assets, although some companies did not disclose such measures.

Panel B of Table 5.5 reveals that all the companies which identified segments by geographical format, except one company in each of 1994, 1995, and 1996, disclosed segment sales or revenues. Although some companies disclosed a measure of segment profit and assets, the bulk did not disclose such measures.

Panel C of Table 5.5 suggests that the results are similar to those of Panel A and B. All the companies, except four companies in 2003, disclosed segment sales or revenues on their geographic side. The majority of companies did not disclose a measure of segment profit and assets. In contrast, all the companies, one company in each of 1994, 1995, 1996 and 1997, disclosed segment sales or revenues on their industry side. The number of companies disclosing a measure of segment profit and assets in the industry side is more than that in the geographic side.

Besides, the findings in Table 5.5 show that the new accounting items required by TAS No.50 (e.g. depreciation, equity method income, etc.) are less prevalent and appear temporary before the ICAAT issued TAS No.50. Note that the listed companies initiated disclosing liabilities only since 1999.

To provide a clear answer about how many companies fully disclose accounting items required by the existing accounting standard (TAS No.24), this study classifies firms into seven groups based on the information that they disclosed: (a) only segment sales (revenues); (b) only segment results (earnings); (c) only segment assets; (d) both segment sales (revenues) and segment results (earnings); (e) both segment sales (revenues) and segment assets; (f) both segment results (earnings) and segment assets; (g) all of three main accounting items required by TAS No.24. These empirical results are described in Table 5.6 based on each reportable format (i.e. industry/line-of-business format, geographical format, and both respectively).

Table 5.6 Number of Companies Disclosing the Main Accounting Items (Classification by the Group of Items Required by TAS No.24)

Panel A: Firms Use Industry/Line-of-Business Format

Item Discloses	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Not Fully Comply with Accounting Standard												
(a) Only Sales or Revenues	1	1	2	7	7	8	7	5	5	5	6	6
(b) Only Segment Results	0	1	0	0	0	0	0	0	0	0	0	0
(c) Only Assets Amount (%, Baht)	0	0	0	0	0	0	0	0	0	0	0	0
(d) Both of Sales or Revenues and Segment Results	6	15	20	22	22	16	21	26	27	30	34	35
(e) Both of Sales or Revenues and Assets Amount (%, Baht)	0	0	0	0	0	2	0	1	3	2	5	6
(f) Both of Segment Results and Assets Amount (%, Baht)	0	0	0	0	0	0	0	0	0	0	0	1
Subtotals	7	17	22	29	29	26	28	32	35	37	45	48
(%)	(20.00)	(26.98)	(28.21)	(32.22)	(30.53)	(25.00)	(27.18)	(30.19)	(33.65)	(34.26)	(37.50)	(34.29)
Fully Comply with Accounting Standard												
(g) All of Sales or Revenues, Segment Results and Assets Amount (%, Baht)	28	46	56	61	66	78	75	74	69	71	75	92
(%)	(80.00)	(73.02)	(71.79)	(67.78)	(69.47)	(75.00)	(72.82)	(69.81)	(66.35)	(65.74)	(62.50)	(65.71)
Totals	**35**	**63**	**78**	**90**	**95**	**104**	**103**	**106**	**104**	**108**	**120**	**140**

Table 5.6 (Continued)

Panel B: Firms Use Geographical Format

Item Discloses	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Not Fully Comply with Accounting Standard												
(a) Only Sales or Revenues	7	4	16	20	15	17	17	25	22	27	28	33
(b) Only Segment Results	0	0	0	0	0	0	0	0	0	0	0	0
(c) Only Assets Amount (%, Baht)	1	0	1	0	0	0	0	0	0	0	0	0
(d) Both of Sales or Revenues and Segment Results	4	8	14	16	19	21	19	23	23	24	30	25
(e) Both of Sales or Revenues and Assets Amount (%, Baht)	0	2	1	1	2	3	0	2	2	3	4	6
(f) Both of Segment Results and Assets Amount (%, Baht)	0	1	0	0	0	0	0	0	0	0	0	0
Subtotals	12	15	32	37	36	41	36	50	47	54	62	64
(%)	(63.16)	(57.69)	(74.42)	(77.08)	(76.60)	(82.00)	(76.60)	(80.65)	(77.05)	(77.14)	(80.52)	(79.01)
Fully Comply with Accounting Standard												
(g) All of Sales or Revenues, Segment Results and Assets Amount (%, Baht)	7	11	11	11	11	9	11	12	14	16	15	17
(%)	(36.84)	(42.31)	(25.58)	(22.92)	(23.40)	(18.00)	(23.40)	(19.35)	(22.95)	(22.86)	(19.48)	(20.99)
Totals	**19**	**26**	**43**	**48**	**47**	**50**	**47**	**62**	**61**	**70**	**77**	**81**

Table 5.6 (Continued)

Panel C: Firms Use Both Industry/Line of Business and Geographical Format

Item Discloses	1994		1995		1996		1997		1998		1999	
	MG	ML	MG	ML	MG	ML	MG	ML	MG	ML	MG	ML
Not Fully Comply with Accounting Standard												
(a) Only Sales or Revenues	5	0	7	2	8	8	6	2	10	3	14	7
(b) Only Segment Results	0	1	0	1	0	0	0	0	0	0	0	0
(c) Only Assets Amount (%, Baht)	0	0	0	0	0	0	0	0	0	0	0	0
(d) Both of Sales or Revenues and Segment Results	2	1	4	3	4	4	8	5	6	6	5	4
(e) Both of Sales or Revenues and Assets Amount (%, Baht)	0	1	0	0	0	0	0	0	0	0	3	6
(f) Both of Segment Results and Assets Amount (%, Baht)	0	0	0	0	0	0	0	1	0	0	0	0
Subtotals	7	3	11	6	12	12	14	8	16	9	22	17
(%)	(63.64)	(27.27)	(68.75)	(37.50)	(75.00)	(75.00)	(70.00)	(40.00)	(80.00)	(45.00)	(95.65)	(73.91)
Fully Comply with Accounting Standard												
(g) All of Sales or Revenues, Segment Results and Assets Amount (%, Baht)	4	8	5	10	4	4	6	12	4	11	1	6
(%)	(36.36)	(72.73)	31.25	62.50	25.00	25.00	30.00	60.00	20.00	55.00	4.35	26.09
Totals	**11**	**11**	**16**	**16**	**16**	**16**	**20**	**20**	**20**	**20**	**23**	**23**

Table 5.6 (Continued)

Item Discloses	2000		2001		2002		2003		2004		2005	
	MG	ML	MG	ML	MG	ML	MG	ML	MG	ML	MG	ML
Not Fully Comply with Accounting Standard												
(a) Only Sales or Revenues	14	5	14	4	19	5	22	3	20	3	22	3
(b) Only Segment Results	0	0	0	0	0	0	0	0	0	0	0	0
(c) Only Assets Amount (%, Baht)	0	0	0	0	0	0	0	0	0	0	0	0
(d) Both of Sales or Revenues and Segment Results	5	4	3	3	3	4	7	7	8	8	7	10
(e) Both of Sales or Revenues and Assets Amount (%, Baht)	0	2	1	3	1	3	1	8	3	8	3	8
(f) Both of Segment Results and Assets Amount (%, Baht)	0	0	0	0	0	0	0	0	0	0	0	0
Subtotals	19	11	18	10	23	12	30	18	31	19	32	21
(%)	(79.17)	(45.83)	(75.00)	(41.67)	(71.88)	(37.50)	(75.00)	(45.00)	(73.81)	(45.24)	(74.42)	(48.84)
Fully Comply with Accounting Standard												
(g) All of Sales or Revenues, Segment Results and Assets Amount (%, Baht)	5	13	6	14	9	20	10	22	11	23	11	22
(%)	(20.83)	(54.17)	(25.00)	(58.33)	(28.13)	(62.50)	(25.00)	(55.00)	(26.19)	(54.76)	(25.58)	(51.16)
Totals	**24**	**24**	**24**	**24**	**32**	**32**	**40**	**40**	**42**	**42**	**43**	**43**

Notes: ML: companies disclose line-of-business or industry segments in notes of financial statements; and MG: companies disclose geographical segments in notes of financial statements.

Table 5.6 indicates that the disclosure practices of the entire sample is based on three main accounting items: (a) segment sales, (b) segment earnings, and (c) segment assets. Panel A indicates that approximately 20-38 percent of sample firms disclosing segments using only the industry/line-of-business format fail to fully comply with TAS No.24 by not disclosing all three accounting information items. Panel B suggests that roughly 58-82 percent of sample firms disclosing segments using the geographical format fail to fully comply with the accounting standard relating to segment reporting. Finally, Panel C shows that a majority of sample firms disclosing segments using both the industry/line-of-business and the geographical format, specifically geographic side, fail to fully comply with the accounting standard relating segment reporting.

Table 5.5 and 5.6 also show that most firms disclose segmental sales and are not likely to disclose segment profits and segment assets. Although TAS No.24 requires companies to disclose segment revenue, segment income, segment assets, some companies express their concerns that disclosing segmental income could endanger its business once the trade counter party finds out about its segment profit margin. Disclosing performance data by product line or geographical area may highlight opportunities previously unknown to competitors, thereby undermining a company's competitive advantage. Segment disclosure may also weaken an enterprise' competitive position, if more detailed information is made available to competitors, customers, suppliers, and others. Once too much information is revealed, the company could lose its power of negotiation. This leads management to withhold certain segment information or to utilize broad, vague segment groupings. For example, a company in the textile sector indicates in the notes of its financial statements of 1999 and 2000 that "the company could not disclose net assets and profit from operations according to sectors because this information is of vital importance to the company's business interests."

The problems of reporting segment assets may also result from the fact that a firm employs common assets which are shared by two or more segments. Paragraph 18 of TAS No.24 addresses this issue and suggests that these assets should be allocated between or among segments using a reasonable basis. The subjectivity and difficulty of asset allocation could hinder segment asset disclosure.

Taken as a whole, most listed companies still have poor segment reporting compliance with respect to the TAS No.24, specifically firms reporting segments by geographical area (as presented in Panel B and C). Regardless the reasons for poor disclosure compliance from the findings of this study should be of concern to both ICAAT and SEC.

As stated previously, in the year 2000, the ICAAT issued TAS No.50, but this standard was unofficially promulgated as one of the accounting standards. An option was given to listed companies to consider whether to voluntarily apply TAS No.50 with their financial statements. However, the result in Table 5.5 shows that in the year 1999, some firms chose to report some items, specifically the liability items required by TAS No.50 but not required by TAS No.24 in reporting segment information. It is likely that those firms recognized some working core accounting standards which were issued to replace the original accounting standards.

Therefore, this study extends the period to examine how many firms voluntarily applied TAS No.50 with their financial statements in the year 1999 rather than the year 2000, until 2005. A survey is made of the segment reporting practices of the 2,349 sample firms by using the classification criteria in Figure 4.2. The results are shown in Table 5.7

Table 5.7 The Number of Listed Companies which Voluntarily Apply TAS No.50 with their Financial Statements (1999-2005)

Data Set in Year	Total Sample Firms	The Number of Firms Which Voluntarily Apply TAS No.50[1]					
		Multi-Segment Firms[2]		Single Segment Firms[3]		Totals	
		Numbers of firms	%	Numbers of firms	%	Numbers of firms	%
1999	325	2	0.62	1	0.31	3	0.92
2000	314	3	0.96	1	0.32	4	1.27
2001	309	7	2.27	1	0.32	8	2.59
2002	309	10	3.24	2	0.65	12	3.88
2003	338	14	4.14	2	0.59	16	4.73
2004	363	24	6.61	2	0.55	26	7.16
2005	391	34	8.70	2	0.51	36	9.21
Totals	**2,349**	**94**	**4.00**	**11**	**0.47**	**105**	**4.47**

Table 5.7 (Continued)

Notes: 1 The number of firms in this table uses the criteria of Figure 4.2. If the first criterion is used to classify any firms, others criteria are ignored. The criteria are as follows:

(1) Does firm refer to "the use of TAS No.50"?

(2) Does firm refer to "management approach", "risk-rewards approach", or "a management approach with a risks-and-rewards safety net" for preparing segment reporting?

(3) Does firm refer to "primary" or "secondary" report for preparing segment reporting?

(4) Does firm adopt a two-tier approach (both by line-of-business and geographic region and disclose items required under TAS No.50 beyond TAS No.24 (such as liabilities, capital addition, other non-cash items, and equity method income)?

2 The "multi-segment firms" group consists of firms that report their operations having more than one segment (e.g. industry segments, geographical segments, or both industry and geographical segments) and have to disclose financial information (such as sales, segment results, or segment assets employed).

3 The "single segment firms" group consists of firms that reveal their operations having only one segment in notes of financial statements.

Table 5.7 reports that based on the methodology described in Figure 4.2, and on approximately 105 firms/year observations (36 firms in the latest year: 2005), all 105 voluntarily applied TAS No.50 on their financial statements. Of a total of 105 firm-year observations, only 11 firm-year observations (10.48 percent) did not show primary segment data under TAS No.50, and hence, claimed to operate in one segment, while there were 94 firm-year observations (approximately 89.52 percent) showing multi-segments in the notes of their financial statements. The number of

multi-segment (single segment) firms increased from only 2 (1) firms in the year 1999 to 34 (2) firms in the year 2005.

Based on Table 5.7, Table 5.8 describes the number of multi-segment firms based on the classification criteria in Figure 4.2 and on the types of reportable segments (i.e. geographical segments, business segments or both dimensions).

To provide more details, this study also classifies the number of multi-segment firms which voluntarily apply TAS No.50 based on firms with year ending December in Panel A, and firms with year ending other than in December in Panel B of Table 5.8. Total listed companies voluntarily applying TAS No.50 is described in Panel C of Table 5.8.

Table 5.8 indicates that no companies, including single segment firms obtained from the classification criteria of Figure 4.2, declared to voluntarily apply TAS No.50 in the notes of their financial statements. One possible reason is that no one wishes to engage himself/herself, because if an enterprise applies TAS No.50 early in its financial statements, such an enterprise has to follow all of the requirements. In particular, auditors face the risk of not knowing how the regulators (i.e. SEC) will respond to disclosures, on which the auditor had rendered an opinion. If the auditor discloses too much information, the client faces a competitive disadvantage. On the contrary, disclosing too little might raise the ire of the regulators.

However, this study finds that a total of 67 firm-year observations (27 firms in the latest year: 2005) since the year 1999 until 2005 take the “management approach”, “risk-rewards approach”, or “a management approach with a risks-and-rewards safety net” for preparing segment reporting information. After obtaining those 67 firm-year observations, this study used the criterion whether firms refer to “primary” or “secondary” reports for preparing segment reporting and finds that an additional 14 firm-year observations (4 firms in the latest year: 2005) voluntarily applied TAS No.50.

Because TAS No.50 does not prohibit a matrix presentation and TAS No.50 expands the amount of information in addition to sales, earnings, and assets, such as liabilities, capital expenditures acquired during the period, etc., this study used these criteria and finds that an additional 13 firm-year observations (3 firms in the latest year: 2005) voluntarily applied TAS No.50. A total of 94 firm-year observations (34

Table 5.8 The Number of Multi-Segment Firms which Voluntarily Apply TAS No.50 in 1999-2005 (Classification Based on the Criteria of Figure 4.2)[1]

Panel A: Companies with Year Ends December

Year	1. Firm refers to "the use of TAS No.50"			2. A management approach with a risks-and-rewards safety net			3.Primary or secondary report			Subtotals (1)+(2)+(3)			4. Items required under TAS No. 50	Totals Based on Figure 4.2[1]	4. Items required under TAS No. 50		Totals[2]			
	ML	MG	MB	ML	MG	MB	ML	MG	MB	ML	MG	MB	MB[1]		ML[2]	MG[2]	ML (a)	MG (b)	MB (c)	(a)+(b)+(c)
1999	0	0	0	2	0	0	0	0	0	2	0	0	0	**2**	1	0	3	0	0	**3**
2000	0	0	0	2	0	0	0	0	0	2	0	0	1	**3**	2	0	4	0	1	**5**
2001	0	0	0	4	1	0	1	0	0	5	1	0	1	7	1	0	6	1	1	**8**
2002	0	0	0	4	2	0	1	0	1	5	2	1	2	**10**	4	1	9	3	3	**15**
2003	0	0	0	6	3	0	2	0	1	8	3	1	2	**14**	4	1	12	4	3	**19**
2004	0	0	0	7	4	2	3	0	1	10	4	3	3	**20**	4	0	14	4	6	**24**
2005	0	0	0	14	6	4	3	0	1	17	6	5	2	**30**	7	0	24	6	7	**37**

Panel B: Companies with Year Ends Other than December

Year	1. Firm refers to "the use of TAS No.50"			2. A management approach with a risks-and-rewards safety net			3.Primary or secondary report			Subtotals (1)+(2)+(3)			4. Items required under TAS No. 50	Totals Based on Figure 4.2[1]	4. Items required under TAS No. 50		Totals[2]			
	ML	MG	MB	ML	MG	MB	ML	MG	MB	ML	MG	MB	MB[1]		ML[2]	MG[2]	ML (a)	MG (b)	MB (c)	(a)+(b)+(c)
1999	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	**0**
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	**0**
2001	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	**0**
2002	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	**0**
2003	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	**0**
2004	0	0	0	3	0	0	0	0	0	3	0	0	1	4	0	0	3	0	1	**4**
2005	0	0	0	3	0	0	0	0	0	3	0	0	1	4	0	0	3	0	1	**4**

Table 5.8 (Continued)

Panel C: Total Listed Companies

Year	1. Firm refers to "the use of TAS No.50"			2. A management approach with a risks-and-rewards safety net			3.Primary or secondary report			Subtotals			4. Items required under TAS No. 50	Totals Based on Figure 4.2[1]	4. Items required under TAS No. 50		Totals[2]			
	ML	MG	MB	ML	MG	MB	ML	MG	MB	ML	MG	MB	MB[1]		ML[2]	MG[2]	ML (a)	MG (b)	MB (c)	(a)+(b)+(c)
1999	0	0	0	2	0	0	0	0	0	2	0	0	0	**2**	1	0	3	0	0	**3**
2000	0	0	0	2	0	0	0	0	0	2	0	0	1	**3**	2	0	4	0	1	**5**
2001	0	0	0	4	1	0	1	0	0	5	1	0	1	**7**	1	0	6	1	1	**8**
2002	0	0	0	4	2	0	1	0	1	5	2	1	2	**10**	4	1	9	3	3	**15**
2003	0	0	0	6	3	0	2	0	1	8	3	1	2	**14**	4	1	12	4	3	**19**
2004	0	0	0	10	4	2	3	0	1	13	4	3	4	**24**	4	0	17	4	7	**28**
2005	0	0	0	17	6	4	3	0	1	20	6	5	3	**34**	7	0	27	6	8	**41**

Notes: 1 The number of firms in this table uses the criteria of Figures 4.2. If the first criterion is used to classify any firms, others criteria are ignored. The criteria include the follows.

(1) Does firm refer to "the use of TAS No.50"?

(2) Does firm refer to "management approach", "risk-rewards approach", or "a management approach with a risks-and-rewards safety net" for preparing segment reporting?

(3) Does firm refer to "primary" or "secondary" report for preparing segment reporting?

(4) Does firm adopt a two-tier approach (both by line-of-business and geographic region and disclose items required under TAS No.50 beyond TAS No.24 (such as liabilities, capital addition, other non-cash items, and equity method income)?

Table 5.8 (Continued)

2 The number of firms is based on the criteria other than Figure 4.2, so the last column is shown the number of firms based on the classification criteria of Figures 4.2 plus the number of firms disclosing segments by using only business segment format or only geographical segment format but presenting information required by TAS No.50.

ML: companies disclose line-of-business or industry segments in notes of financial statements; and MG: companies disclose geographical segments in notes of financial statements.

firms in the latest year: 2005) were thus sorted and found to voluntarily apply TAS No.50 based on the classification criteria in Figure 4.2.

However, when collecting the sample, this study found that 25 firm-year observations (7 firms in the latest year: 2005 (see sub-column “ML” and “MG” of the column “4. Items required under TAS No.50”)) disclosed some accounting information as required by TAS No.50 (e.g. liabilities, capital expenditures acquired during the period, etc.) but beyond the extent to which was required by TAS No.24. Although those 25 firm-year observations do not explicitly use TAS No.50, they voluntarily disclosed some segment information according to the requirements of TAS No.50.

After combining the additional criteria, apart from the data in Figure 4.2, Table 5.8 (See the last column) mentions that since 1999-2005, of the 119 firm-year observations (41 firms in the latest year: 2005), 78 firm-year observations (27 firms in the latest year: 2005) determined reportable segments based on business segments. A total of 18 firm-year observations (6 firms in the latest year: 2005) determined reportable segments based on geographical segments. The remaining 23 firm-year observations (8 firms in the latest year: 2005) determined reportable segments based on a mix of line-of-business or industry and geographical segments.

In summary, although TAS No.50 has been delayed to be pronounced as an accounting standard, some companies perhaps recognized the benefits of voluntarily applying the new accounting standard, as reflected in this empirical survey.

5.2 Are Segmental Disclosures of Listed Companies in the Notes of Financial Statements Consistent with Those in Other Parts of the Annual Reports in 2005?

This section describes the results of whether segmental disclosures in the notes of financial statements are consistent with other information contained in the annual reports including (a) introductory annual report materials, and (b) management discussion and analysis. Considering the consistency contained in the introductory annual report materials, this study focuses on two parts: (a) the revenue structure of listed companies, and (b) items other than the management discussion and analysis,

revenue structure, and audited statements (i.e. the shareholder's letter, the description of the nature of the business, operations review, etc.).

In order to control for subjectivity in interpreting the annual reports, the empirical results were reviewed by a second person.[11] The sample data of this study consists of 349 sample companies in 2005. Of the 349 sample companies, 240 are categorized into the multiple classes of segment disclosures, and 109 are classified into the single class of segment disclosures. Empirical results are used to consider the consistency between segmental disclosures in the notes of financial statements and other parts of annual reports and are discussed based on these two types of segmental disclosures: (a) multiple classes of segment disclosures, and (b) single class of segment disclosures.

5.2.1 Analysis of Multiple Classes of Segment Disclosures

This section aims to consider whether the disclosures made on multiple classes of segment disclosures are consistent with the company reports taken as a whole. The 240 multi-segment firms can be classified into (a) 41 firms that reported segments by using both the industry/line of business and geographical format, (b) 128 firms that reported segments by using the industry (line of business) format, and (c) 71 firms that reported segments by using the geographical format.

This study firstly considers the consistency of segment data reported in the notes of financial statements and in the introductory annual report materials (i.e. the shareholder's letter, the description of nature business, operations review, etc.). The empirical results are reported in Table 5.9.

[11] This person graduated with Bachelor's degree and Master's degree in Accounting from Chulalongkorn University, as well as has experienced in accounting field (e.g. internal auditing, business development, accounting manager, system analyst, etc.) over 10 years.

Table 5.9 Consistency of Reportable Segment Disclosures with Introductory Annual Report Information[1] for Companies with Multi-Segment Classes

Analysis	Multi-Segment Classes						Totals	
	MB[2]	%	ML[2]	%	MG[2]	%	Firms	%
Consistency	10	24.39	42	32.81	17	23.94	69	28.75
Consistency (Same classification but difference in the number of segments)	27	65.85	58	45.31	20	28.17	105	43.75
Partial Consistency (A part of classification)	0	0.00	16	12.50	15	21.13	31	12.92
Partial Consistency (A part of classification but difference in the number of segments)	4	9.76	10	7.81	14	19.72	28	11.67
Inconsistency	0	0.00	2	1.56	5	7.04	7	2.92
No Information[3]	0	0.00	0	0.00	0	0.00	0	0.00
Totals	**41**	**100.00**	**128**	**100.00**	**71**	**100.00**	**240**	**100.00**

Notes: 1 Introductory annual report information includes items other than the management discussion and analysis, revenue structure, and audited statements, for example the shareholder's letter, the description of nature business, operations review, etc.

2 MB: companies disclose both line-of-business or industry and geographical segments in notes of financial statements; ML: companies disclose line-of-business or industry segments in notes of financial statements; and MG: companies disclose geographical segments in notes of financial statements.

3 No information: the annual report does not have items other than the management discussion and analysis, revenue structure, and audited statements, for example the shareholder's letter, the description of nature business, operations review, etc.

The results in Table 5.9 shows that 174 (72.50%) firms reported their segment types (i.e. business segments, geographical segments, or both) in the notes of their financial statements which is consistent with the information given in their introductory annual report materials (i.e. letter to shareholders, operation reviews,

etc.). Of these 174 firms, only 69 provided segment information consistent with the types of segmental disclosures and their number of segments. In contrast, 105 firms reported segment information consistent with the types of segments but inconsistent with the number of their segments (the segment footnote indicates more/less segments than reflected in the introductory annual report materials).

For example, a company in the technology industry reveals that it operates in four business segments in the notes of its financial statements, but claims to operate in seven product types in the introductory annual report material (i.e. letter to shareholders, operation reviews, etc.). Otherwise, a company in the technology industry reveals its segments as “in country” and “foreign countries (export sales)” in the notes of financial statement, but indicates in the introductory annual report material (i.e. letter to shareholders, operation reviews, etc.) that “the successfully expanded markets included those in Europe, America, Middle East, India, Pakistan, Bangladesh, China, Japan, Korea, Taiwan, Australia, New Zealand, and ASEAN”.

In addition, segment disclosures are rated as “inconsistent”, if supplemental information included in the introductory annual report material does not agree with the segment information in the notes of its financial statements. For example, a company in the agro and food industry reveals that its products can be classified into four types, but states its operation segments as “in country” and “foreign countries” in the notes of its financial statements.

Table 5.9 also finds that 7 (2.92%) firms reported multiple classes of segments inconsistent with the introductory annual report materials (i.e. letter to shareholders, operation reviews, etc.). Inconsistencies are problematic for firms revealing segments using the geographical format, as shown in Table 5.9.

Further, segment disclosures are rated as “partial consistency” when the classification of segments in the introductory annual report information is a subset of that contained in the notes of its financial statements or where the classification of segments in the notes of its financial statements is subset of that in the introductory annual report information. Table 5.9 indicates that 59 (24.58%) sample firms are rated as “partial consistency”. Of the 59 sample firms, 31 are rated as “partial consistency (a part of classification)” and 28 are rated as “partial consistency (a part of classification but difference in the number of segments)”. The major difference

between the two groups is that the first group is made up of firms which provide information on the number of segments in the notes of their financial statements equal to that contained in the introductory annual report materials. For example, a firm in the technology industry reveals two geographical segments in the notes of its financial statements, but it indicates two geographical locations and three businesses in the introductory annual report material.

In contrast, the latter example firm provides the number of segments in the notes of its financial statements which indicate more/less segments than that in the introductory annual report material (i.e. letter to shareholders, operation reviews, etc.). For instance, a company in the agro and food industry reveals geographical segments as “in country” and “foreign countries” in the notes of its financial statements, but reveals that it operates in the restaurant business in Thailand and in foreign countries (i.e. England, Switzerland, Singapore, etc.), bakery products and frozen meals (the products is exported to Japan, Switzerland, France, etc.), and others in the introductory annual report material (i.e. letter to shareholders, operation reviews, etc.).

In conclusion, most Thai listed companies described the format that they used for identifying operating segments in the notes of their financial statements and this was found to be consistent with the information contained in the introductory annual report materials (i.e. letter to shareholders, operation reviews, etc.). More than half of them provided information on the number of segments in the notes of their financial statements and indicated more/less segments than that in their introductory annual report materials (i.e. letter to shareholders, operation reviews, etc.).

These results are due to the content contained in the introductory annual report materials (i.e. the shareholder’s letter, the description of nature business, operations review, etc.) which are addressed broadly. Hence, this study further uses the items contained in the topic of revenue structures in the description of the nature of businesses as a new source to analyze the consistency of firms disclosing multi-segments. Most companies reveal their revenue structures based on their organizational grouping which often correspond with the determinable activities of the enterprise. The empirical results are described in Table 5.10 as follows:

Table 5.10 Consistency of Reportable Segment Disclosures with Revenue Structure[1] for Companies with Multi-Segment Classes

Analysis	Multi-Segment Classes						Totals	
	MB[2]	%	ML[2]	%	MG[2]	%	Firms	%
Consistency	7	17.07	59	46.09	17	23.94	83	34.58
Consistency (Same classification but difference in the number of segments)	9	21.95	52	40.63	2	2.82	63	26.25
Partial Consistency (A part of classification)	10	24.39	2	1.56	19	26.76	31	12.92
Partial Consistency (A part of classification but difference in the number of segments)	9	21.95	3	2.34	0	0.00	12	5.00
Inconsistency	0	0.00	3	2.34	27	38.03	30	12.50
No Information[3]	6	14.63	9	7.03	6	8.45	21	8.75
Totals	**41**	**100.00**	**128**	**100.00**	**71**	**100.00**	**240**	**100.00**

Notes: 1 Revenue structure is the sub-item in the description of nature business which most companies reveal it based on nature business or organization grouping.

2 MB: companies disclose both line-of-business or industry and geographical segments in notes of financial statements; ML: companies disclose line-of-business or industry segments in notes of financial statements; and MG: companies disclose geographical segments in notes of financial statements.

3 No information: company does not reveal revenue structure as a topic in annual report.

The results shown in Table 5.10 suggest that of the 240 sample firms which provided multiple classes of segment disclosures, 146 (60.83%) provided segmental disclosures in the notes of their financial statements consistent with those provided in their revenue structure. Of these 146 sample firms, 83 are rated as “consistency” where supplemental information included in the revenue structure agrees with the segment information contained in the notes of their financial statements (consistent with the types of segment and the number of segments). The remaining 63 firms are

rated as “consistency (same classification but difference in the number of segments)”. As an example, a company in the property and development industry claims to operate in two businesses in the notes of its financial statements, but reveals three businesses in its revenue structure. On the other hand, a company in the agro and food industry reveals that it operates in two business segments (i.e. frozen and canned food products, and others) and indicates two geographical segments (i.e. in countries and foreign countries) in the notes of its financial statement, while it indicates that its operations consist of (a) production and export of frozen and canned food products, (b) production and distribution of packaging products, (c) production and distribution of animal feeds and agricultural products, (d) food business in domestic market, and (e) overseas investments, in its revenue structure.

In addition, Table 5.10 finds that 30 sample firms are rated as “inconsistency” where supplemental information included in the revenue structure does not agree with the segment information contained in the notes of their financial statements (not consistent with the types of segmental disclosures). Specifically, 27 out of these 30 sample firms disclosed geographical segments, and only 3 sample firms reported business segments. For example, a company in the consumer product industry reveals that its operations are separated into two geographical segments (i.e. “in country” and “foreign countries”) in the notes of its financial statements, but indicates that its revenues can be classified based on two product lines in the revenue structure.

Finally, Table 5.10 indicates that 43 sample firms are rated in the “partial consistency” category where their segments in the revenue structure is a subset of that found in the notes of their financial statements or where the classification of segments in the notes of their financial statements is a subset of that in the revenue structure. Of these 43 sample firms, 31 are in the group of “partial consistency (a part of classification)”, 12 are in the group of “partial consistency (a part of classification but difference in the number of segments)”. The major difference between the two groups is that the former group, the group of “partial consistency (a part of classification”, provides the number of segments in the notes of their financial statements whose number is equal to that found in the revenue structure information. For instance, a company in the industrial industry reveals two geographical segments in the notes of

financial statements, but indicates two geographical segments with each geographical segment consisting of three product lines in the revenue structure.

In contrast, the latter group, the group of “partial consistency (a part of classification but difference in the number of segments)”, provides segment footnotes which indicate more/less segments than reflected in the revenue structure information. For example, a company in the property and development industry reveals that its operations are split into two geographical segments (i.e. “in country” and “foreign countries”) in the notes of its financial statements. The group of “in country” consists of two business activities, while the group of “foreign countries” consists of one business activity. However, this study finds that the company classifies revenues into five business activities based on revenue structure information.

This study further evaluates the consistency by comparing the segmental disclosures in the notes of financial statements with that found in the management’s discussion and analysis section of annual reports. The management discussion and analysis section is one of the ways that management communicates the financial condition and the operational results of the company to investors. When segment reporting information is provided on how material a segment should be before it is reported separately and how to limit the segments to a reasonable number so as to avoid unnecessary complexity, the identification of segments for reporting should be quite significant. This study assumes that management should explain the performance of those segments to investors. This would create a direct and positive link between the information in the management discussion and analysis section and segment reporting. Details of the analysis are shown in Table 5.11.

Table 5.11 Consistency of Reportable Segment Disclosures with Management Discussion and Analysis for Companies with Multi-Segment Classes

Analysis	Multi-Segments Classes						Totals	
	MB[1]	%	ML[1]	%	MG[1]	%	Firms	%
Consistency	5	12.20	54	42.19	22	30.99	81	33.75
Consistency (Same classification but difference in items)	14	34.15	51	39.84	14	19.72	79	32.92
Partial Consistency (A part of classification)	9	21.95	3	2.34	11	15.49	23	9.58
Partial Consistency (A part of classification but difference in the number of segments)	8	19.51	7	5.47	3	4.23	18	7.50
Inconsistency	4	9.76	12	9.38	19	26.76	35	14.58
No Information[2]	1	2.44	1	0.78	2	2.82	4	1.67
Totals	**41**	**100.00**	**128**	**100.00**	**71**	**100.00**	**240**	**100.00**

Notes: 1 MB: companies disclose both line-of-business or industry and geographical segments in notes of financial statements; ML: companies disclose line-of-business or industry segments in notes of financial statements; and MG: companies disclose geographical segments in notes of financial statements.

2 No information: company does not reveal management discussion and analysis as a topic in annual report.

Table 5.11 reveals that of 240 sample firms disclosing segment information, 160 (66.67%) report types of segments in the notes of financial statements consistent with the management discussion and analysis section of their annual reports. Specifically, 81 firms provided segment information consistent with the types of segmental disclosures and the number of segments, and 79 firms reported segment information consistent with the types of segments but inconsistent with the number of segments (the number of segments in the notes of financial statements indicates more/less segments than that in the management discussion and analysis section). Of these 160 firms, 105 firms defined types of segments as business activities in the notes of their financial statements. However, 51 firms provided segment footnotes

which indicated more/less segments than reflected in the management discussion and analysis section. The remaining 54 firms provided segment footnotes which matched the information of segments reflected in the management discussion and analysis section of their annual reports.

Table 5.11 also illustrates that 35 companies provided supplemental information in the management discussion and analysis section that did not agree with the segment information in the notes of their financial statements (not consistent with the types of segmental disclosures). For example, a company in the agro and food industry disclosed segment information by geographical segments (i.e. in country and in foreign countries) in the notes of their financial statements, but revealed in the management discussion and analysis section that "income from sales earned by the company and its (subsidiaries) in 2005 out of selling shrimp feeds amounted to 48%, whereas fish feeds amounted to 45% with raw materials amounted to 5%..." Another example is that a company in the agro and food industry disclosed that it has two business segments in the notes of financial statements, but reveals that it has export expenses and does not reveal any business segment information in the management discussion and analysis section.

Finally, Table 5.11 indicates that 41 firms are rated as "partial consistency" where the classification of segments in the management discussion analysis section is a subset of that contained in the notes of financial statements or where the classification of segments in the notes of financial statements is a subset of that found in the management discussion section. Of 41 sample firms, 23 are rated as "partial consistency (a part of classification), and 18 are rated as "partial consistency (a part of classification but difference in the number of segments)". The major difference between the two groups is that the former provides the number of segments in the notes of their financial statements that is equal to that found in the management discussion section. For example, a company in the agro and food industry indicates that it operates in six business segments and refers to some information about the exchange rates and the export restricts in the management discussion and analysis section, but reveals only information for six business segments in the notes of financial statement. As another example, a company in the industrial industry reveals geographical segments (i.e. in country and foreign countries) in the notes of financial

statements, while it indicates that it has three products and two geographical segments (i.e. in country and foreign countries) in the management discussion and analysis.

In contrast, the latter group, the group of "partial consistency (a part of classification but difference in the number of segments)", provides segment footnotes which indicate more/less segments than reflected in the management discussion section, for instance, a company in the property and construction industry reveals seven business segments in the notes of financial statements, but indicates five business segments in the management discussion and analysis section. More importantly, some business segments refer to the export sales and market areas, and some business segments refer to geographical location (i.e. China and India).

In summary, the proportion of firms disclosing segment information with accuracy as reflected by the proper disclosure of their business and international operations of their multiple segments is about 29-35 percent, based on Table 5.9, 5.10, and 5.11. The remaining proportion is made up of firms that provide more or less information about their activities than the information stated in their supplementary data; and that the segment disclosures information of these firms in the notes of their financial statements do not match up with how these companies are actually organized and then see themselves in practice. This would seem that a company's organization which is constructed to cope with its various activities could provide verifiable criteria, but the empirical results show that such modest criteria are not being met. The possible explanation is due to the lack of perspective guidance in presenting segment information, and the ambiguity of the wordings of accounting standard. More importantly, the identification of segments is the responsibility of management. It is up of them to exercise judgment in determining how the enterprise activities are to be grouped for reporting as segments. But there is no rigorous auditing standard for segment information. These reasons allow much interpretation for preparing segment reports and results in inconsistency in segmental disclosures.

5.2.2 Analysis of Single Class of Segment Disclosures

When the existing accounting standard allows companies to exercise considerable judgment in determining what is significant, the inconsistency is perhaps more serious in the case of those companies making only a single class of segment

disclosures. Details of an analysis 109 sample companies disclosing information under the single segment class are shown below.

The first comparison measures the consistency of the reportable segment disclosures found in the notes of financial statements with the introductory annual report information, including items other than the management discussion and analysis, revenue structure, and audited statements (i.e. the shareholder's letter, the description of nature business, operations review, etc.). The empirical evidence is shown in Table 5.12.

Table 5.12 Consistency of Reportable Segment Disclosures with Introductory Annual Report Information[1] for Companies with Single Segment Class

Analysis	Single Segment Class	
	Firms	**%**
Consistency	29	26.61
Consistency (Can be grouped into one industry)[2]	35	32.11
Consistency (Less than 10%)[3]	4	3.67
Inconsistency	41	37.61
No Information[4]	0	0.00
Totals	**109**	**100.00**

Notes: 1 Introductory annual report information includes items other than the management discussion and analysis, revenue structure, and audited statements, for example the shareholder's letter, the description of nature business, operations review, etc.

2 To ensure for only the inconsistency, this table classifies firms having inconsistency of reportable segment disclosures with those in introductory annual report information by the reason that those segments having the similar manner of segments and can be grouped into one segment into the group of "consistency (can be grouped into one industry)".

3 TAS No.24 indicates that the 10 percent of consolidated revenue or operating profit or total assets may be used as the guidelines of identifying segments. Thus, to avoid unnecessary inconsistency and this table classifies

Table 5.12 (Continued)

firms having inconsistency of reportable segment disclosures with those in introductory annual report information because of the 10% criteria into the group of "consistency (less than 10%)".

4 No information: the annual report does not have items other than the management discussion and analysis, revenue structure, and audited statements, for example the shareholder's letter, the description of nature business, operations review, etc.

Table 5.12 shows that only 29 (26.61%) of 109 sample firms actually report operations as only one segment. 35 (32.11%) firms made a single class of segment disclosures in the notes of their financial statements, while they provided segment information based on product lines in the introductory section of their annual reports (i.e. the shareholder's letter, the description of nature business, operations review, etc.). However, these product lines could have been grouped into one industry. For example, a company in the property and construction industry reveals in the notes of financial statements that it is in one business segment, while it indicates that it has offered construction services consisting of three types: (a) electrical and mechanical engineering, (b) infrastructure engineering, and (c) energy and environment engineering (including general construction) in the introductory annual report material (i.e. the shareholder's letter, the description of nature business, operations review, etc.). The combining of business units is perhaps a vertical combination which depends on management's judgment in interpreting the classifications of industry segments. Only 4 (3.67%) firms discovered that their operation of segments is less than ten percent, so their segments are insignificant.

Table 5.12 also indicates that 41 (37.61%) of 109 firms provided segment information which is not consistent with how they see their own activities judging from the supplementary information in their annual reports. For example, a company in the technology industry reveals in the notes of its financial statements that it operates in one business segment and one geographical area, but indicates in the introductory annual report material (i.e. the shareholder's letter, the description of

nature business, operations review, etc.) that the products of the company can be categorized into (a) sewing machine products, (b) household electrical appliance products, (c) audio and video products, (d) motorcycles, (e) mobile telephone, with the addition of a new segment that produces a range of agricultural equipment products. As an example, a company in the industrial industry reveals that it operates in one segment in the notes of financial statements, but it reports in the introductory annual report material (i.e. the shareholder's letter, the description of nature business, operations review, etc.) that it has three manufacturing operations in three countries and most of the company's production is exported to its foreign customers.

This inconsistency of reporting segments perhaps results from the information given in the introductory annual report materials (i.e. the shareholder's letter, the description of nature business, operations review, etc.) which are addressed broadly.

To limit the interpreting, the second comparison measured the consistency between the reportable segment disclosures in the notes of financial statements and those in the revenue structure. The empirical analysis is shown in Table 5.13 as follows.

Table 5.13 Consistency of Reportable Segment Disclosures with Revenue Structure[1] for Companies with Single Segment Class

Analysis	**Single Segment Class**	
	Firms	**%**
Consistency	22	20.18
Consistency (Can be grouped into one industry) [2]	30	27.52
Consistency (Less than 10%)[3]	21	19.27
Inconsistency	19	17.43
No Information[4]	17	15.60
Totals	**109**	**100.00**

Notes: 1 Revenue structure is the sub-item in the description of nature business which most companies reveal it based on nature business or organization grouping.

Table 5.13 (Continued)

2 To avoid unnecessary inconsistency, this table classifies firms having inconsistency of reportable segment disclosures with those in topic of revenue structure by the reason that those segments having the similar manner of segments and can be grouped into one segment into the group of "consistency (can be grouped into one industry)".

3 TAS No.24 indicates that the 10 percent of consolidated revenue or operating profit or total assets may be used as the guidelines of identifying segments. Thus, to avoid unnecessary inconsistency and this table classifies firms having inconsistency of reportable segment disclosures with those in the topic of revenue structure because of the 10% criteria into the group of "consistency (less than 10%)".

4 No information: company does not reveal revenue structure as a topic in annual report.

Table 5.13 shows that of 109 sample firms, only 22 (20.18%) actually reported operations as only one segment. 30 (27.52%) firms have made a single class of segment disclosures in the notes of their financial statements, but the revenue structure provides segment information based on product lines which could grouped into one industry. For example, a company in the industrial industry reveals that it operates in only one line of business, and its operation is in Thailand. However, the company defines its revenue structure as coming from several products such as sheet products, rolled products, and other products.

Another example is that a company in the property and construction industry revealed that it operates in only one segment in the notes of its financial statements, while it categorized the revenue structure into bored pilling, diaphragm wall construction, civil works including foundation and building construction, and various testing services.

Moreover, 21 (19.27%) firms classify revenue structure into segments, but those segments are less than ten percent, so those companies might not identify segments in the notes of financial statements.

Table 5.13 also indicates that 19 (17.43%) of 109 companies provided segment information which is not consistent with how they see their own activities judging from supplementary material stated in their annual reports. For example, a company in the industrial industry revealed that it operates in only one segment in the notes of its financial statements. However, the company categorizes its revenue structure into domestic sales and international sales.

An additional example is that a company in service industry that did not disclose segment information as a topic in the notes of its financial statements, but categorized its revenue structure into three product groups including (a) soft line: clothes, cosmetics, and accessories leather goods, etc.; (b) hard line: home furnishings and automobile accessories and equipment, etc.; and (c) others. Finally, this study finds that 17 sample firms did not identify the revenue structure as a topic in their annual reports.

A final comparison measured the consistency of reportable segment disclosures with the management discussion and analysis section. The management discussion and analysis section is a way in which management communicates the financial condition and the operation results of the company to investors. Thus, management should explain the performance of the significant segment to investors. The empirical analysis is shown in Table 5.14 as below.

Table 5.14 Consistency of Reportable Segment Disclosures with Management Discussion and Analysis for Companies with Single Segment Class

Analysis	**Single Segment Class**	
	Firms	**%**
Consistency	52	47.71
Consistency (Can be grouped into one industry) [1]	22	20.18
Consistency (Less than 10%)[2]	9	8.26
Inconsistency	24	22.02
No Information[3]	2	1.83
Totals	**109**	**100.00**

Table 5.14 (Continued)

Notes: 1 To avoid unnecessary inconsistency, this table classifies firms having inconsistency of reportable segment disclosures with those in topic of management discussion and analysis by the reason that those segments having the similar manner of segments and can be grouped into one segment into the group of "consistency (can be grouped into one industry)".

2 TAS No.24 indicates that the 10 percent of consolidated revenue or operating profit or total assets may be used as the guidelines of identifying segments. Thus, to avoid unnecessary inconsistency and this table classifies firms having inconsistency of reportable segment disclosures with those in the topic of management discussion and analysis because of the 10% criteria into the group of "consistency (less than 10%)"

3 No information: company does not reveal management discussion and analysis as a topic in annual report.

Table 5.14 illustrates that of 109 sample firms, only 52 (47.71%) identify segments in the notes of financial statements consistent with those in management discussion, but this interpretation is cautious because those companies identify aggregate performance, and this study assumes that their operations are in only one segment. While 22 (20.18%) firms made a single class of segment disclosures in the notes of financial statements, but the management discussion and analysis provides information on segments based on product lines which can be grouped into one industry. 9 (8.26%) firms divided operations into groups of product lines or geographical segments, but those segments is comprised of less than ten percent. Thus, those companies did not identify segment in the notes of financial statements.

Table 5.14 also indicates that 24 (22.02%) of 109 firms provided segment information which is not consistent with how they see their own activities judging from the supplementary information in their annual reports. For example, a company in the technology industry did not disclose any segment information as a topic in the

notes of financial statement, but the company indicates that it has subsidiaries in three countries. A further example is that a company in the technology industry revealed that it operates in one segment, but discusses its performance based on three business groups. Finally, 2 companies did not identify the management discussion and analysis as a topic in their annual reports.

In summary, the consistency of segment disclosures investigated in this section relates mainly to the consistency and compatibility of the basis of disclosure used with available information in company reports. A problem in identifying separate classes of these activities (i.e. there is the difference in the number of segments and the types of reportable segments) exists. For example, some companies identify segment information based on either lines of business segments or geographical segments, as reflected in the line of “partial consistency (a part of classification)” and “partial consistency (a part of classification but difference in the number of segments)” in Table 5.9, 5.10, and 5.11; although they should describe the activities of each reported industry segment and indicate the composition of each reported geographical area (paragraph 9 and 21 of TAS No.24). Some companies also provide segment information in the notes of financial statements more/less than that stated in the supplementary disclosures of their company reports, as reflected in the line of “consistency (same classification but difference in the number of segments) and “partial consistency (a part of classification but difference in the number of segments) in Table 5.9, 5.10, and 5.11. Finally, some companies have provided segment information in the notes of financial statements that is not consistent with how they see their activities assessed from the supplementary disclosures in their company reports, as reflected in the line of “inconsistency” in Table 5.9, 5.10, 5.11, 5.12, 5.13, and 5.14.

CHAPTER 6

THE EMPIRICAL RESULTS OF THE USEFULNESS OF SEGMENTAL INFORMATION

This chapter presents the empirical results of the usefulness of segmental information by focusing two research questions as follows.

(a) Does segment data provide incremental information beyond that contained in the firm level data?

(b) Is future performance more strongly associated with segment reporting information than with aggregated information?

Details regarding empirical results of each research questions are discussed as below.

6.1 Does Segment Data Provide Incremental Information beyond That Contained in the Firm Level Data?

The objective of this question is to investigate the relevance of segmental disclosures on the security prices of Thai listed companies. The measure of a firm's segment profitability is disclosed in its segment results. In general, the segment results are the difference between segment revenues and segment expenses which reflect operating profits. This study examines whether disclosures of segment earnings under an accounting standard relating to segment reporting provide value relevant information beyond consolidated earnings. Based on the criteria discussed in Section 4.3.2, Table 6.1 presents the number of final sample firms included in testing the first hypothesis.

Table 6.1 Number of Firms in Sample when Considering the Value Relevance of Segment Earnings

Firms having segment information as either industry segments or geographical segments	1,628
Minus Firms having negative book value of equity, with missing pricing data, missing segment earnings, or uncompleted data[1].	554
The remaining number of sample	1,074
Minus Outliers and Influential Observations[2]	31
Number of firms incorporated to the analysis	1,043

Notes: 1 Firms with uncompleted data: firms voluntarily disclose geographical segment information as city in Thailand, firms with consolidated data but show segmental information by using only the data of parent company.

2 Outliers and influential observations are defined as data points having the leverage value more than $2p/n$ and having the absolute value of *DIFFITS* (the difference between predicted observation without the i^{th} observation deleted and predicted observation with i^{th} observation deleted) more than $2\sqrt{p/n}$ based on each pair model which are compared; where p: number of regression coefficients and n is sample size. The observations having the absolute value of studentized deleted residuals more than 3 also are deleted.

There are 1,043 firm-year observations for the period 1994-2005 which are included in this study. Table 6.2 presents the descriptive statistics for all dependent and independent variables. The simple statistics for each variable are also presented by types of segments (business segments and/or geographical segments) to examine for any pattern for each variable that may exist. To apply a uniform regression model to the sample which consists of firms with different segments, this study ranks segments by sales. The average of the number of segments per firm is stated in Table 6.2, Panel D.

Table 6.2 Database and Sample Descriptive Statistics for 1994-2005 when Testing the Value Relevance of Segment Earnings

Panel A: Descriptive Statistics of Total Sample

	P_{it}	BV_{it}	E_{it}	$e_{i,1,t}$	$e_{i,2,t}$	$e_{i,3,t}$	$Eli_{i,t}$	$other_{it}$	$In\Pr ice_{it}$
N	1,043	1,043	1,043	1,043	1,043	1,043	1,043	1,043	1,043
Mean	36.9975	27.5883	2.5713	5.1063	1.4589	0.3750	-0.1388	-4.2632	2.7884
Median	16.0000	19.5498	1.3082	2.6843	0.4056	0.0000	0.0000	-1.8243	2.7726
Std. Deviation	71.2565	26.6116	6.5799	7.7187	3.1873	1.8347	1.2784	7.6890	1.2620
Minimum	0.2000	0.0118	-33.9479	-50.0121	-6.9412	-19.0821	-17.7021	-58.6412	-1.6094
Maximum	1,234.0000	178.7671	33.8649	49.4147	30.0832	19.6130	7.6027	42.8685	7.1180

Panel B: Descriptive Statistics of Firms Reporting Segments as Business Segments

	P_{it}	BV_{it}	E_{it}	$e_{i,1,t}$	$e_{i,2,t}$	$e_{i,3,t}$	$Eli_{i,t}$	$other_{it}$	$In\Pr ice_{it}$
N	801	801	801	801	801	801	801	801	801
Mean	37.0660	25.6318	2.0677	4.4952	1.3171	0.4758	-0.1132	-4.1058	2.7233
Median	14.5000	18.9306	1.0273	2.3250	0.4032	0.0000	0.0000	-1.8680	2.6742
Std. Deviation	76.6423	24.5351	6.5047	7.3336	2.9531	2.0717	1.2492	7.1881	1.2927
Minimum	0.2000	0.0118	-33.9479	-50.0121	-6.9412	-19.0821	-13.9350	-53.7183	-1.6094
Maximum	1,234.0000	144.1963	33.8649	49.4147	30.0832	19.6130	3.4562	42.8685	7.1180

Table 6.2 (Continued)

Panel C: Descriptive Statistics of Firms Reporting Segments as Geographical Segments

	P_{it}	BV_{it}	E_{it}	$e_{i,1,t}$	$e_{i,2,t}$	$e_{i,3,t}$	$Eli_{i,t}$	$other_{it}$	$In\,\mathrm{Pr}\,ice_{it}$
N	242	242	242	242	242	242	242	242	242
Mean	36.7709	34.0643	4.2380	7.1291	1.9281	0.0413	-0.1132	-4.7844	3.1057
Median	22.3250	24.5820	2.5442	4.2566	0.4208	0.0000	0.0000	-1.5694	3.1057
Std. Deviation	49.5413	31.7622	6.5657	8.5858	3.8323	0.4027	1.2492	9.1514	1.1308
Minimum	1.7600	0.0145	-12.5568	-10.7333	-2.4000	-3.2299	-13.9350	-58.6412	0.5653
Maximum	418.0000	178.7671	27.5408	48.2787	29.2011	2.5131	3.4562	20.1169	6.0355

Panel D: Numbers of Segments in Sample

	Total Sample	**Business Segments**	**Geographical Segments**
N	1,043	801	242
Mean	2.8802	3.1174	2.0950
Median	2.0000	3.0000	2.0000
Std. Deviation	1.2141	1.2762	0.4013
Minimum	2.0000	2.0000	2.0000
Maximum	8.0000	8.0000	4.0000

Note: The data consists of 1,043 firm-year observations.

Definition of Variables:

P_{it} : the price per share of firm i on the date of submitting financial statements to the SET ;

BV_{it} : book value of equity per share of firm i at the end of accounting period t ;

Table 6.2 (Continued)

E_{it} : the income before extraordinary items per share of firm i at the end of accounting period t;

$e_{i,j,t}$: the segment results per share of the segment j of firm i at the end of accounting period t; j=1, 2, and 3 are ranked by sales to apply a uniform regression model to the sample which consists of firms with a different segments;

$other_{it}$: the adjusted items making the sum of segment results equals the income before extraordinary items per share of firm i at the end of accounting period, ; this variable is calculated by using the E_{it} less the sum of segmented earnings;

$Eli_{i,t}$: Eliminated transaction in segment reports; and

$In\,\mathrm{Pr}\,ice_{it}$: The base-e logarithm of price.

Table 6.2, Panel A, B and C indicate that the mean of each variable, except the eliminated transaction (Eli_{it}) and the adjusted items ($other_{it}$), is larger than the median. These sample sets are right skewed, reflecting the fact that most firms are of moderate size, but some are very large. In general, larger firms can better afford information production costs and are less susceptible to competitive disadvantages, so larger firms are likely to disclose more information than smaller firms. Clearly, the variables distribution of firms is not normal. More specifically, the mean of stock prices is 36.9975, while the median stock price is 16.0000. The distribution is skewed to the right; no firm has a negative price, most firms have moderate prices, and a few have prices that are very high.

Therefore, transformation involving the dependent variable may be generally required before the Ordinary Least Squares (OLS) regression can be applied. This is, because one assumption of linear multiple regression models is that the regression model error (residual), the difference between the actual value of dependent variable and the predicted value of dependent variable, is normally distributed. Otherwise, the distribution of residuals could be approximately examined by the distribution of a dependent variable.

When this study transforms the stock price variable, the mean is 2.7884 and the median is 2.7726. This result implies that when transforming the dependent variable, the distribution is less skewed. More importantly, the transformation of the dependent variable also helps to moderate the heteroskedasticity problem in this study. The beauty of the widespread incidence of lognormal populations also greatly expands the applicability of exact test procedures such as the t-test. Stewart (2005: 69) also addresses that the inferential methods that apply model which a sample drawn from a lognormal distribution – both estimation and testing – are the same as those for the model random sampling from a normal distribution.[12] The only difference is that the logs are taken from the data. Instead of specifying stock prices as lognormal around a

[12] If data are obtained by random sampling from a normal distribution, the statistical model is $Y_i \sim n.i.d.(\mu, \sigma^2)$ or equivalently, $Y_i = \mu + \varepsilon_i$, $\varepsilon_i \sim n.i.d(0, \sigma^2)$. However, an interesting feature of many such distributions is that although the variable itself is clearly non-normal, its logarithm is approximately normal. Formally, a random variable Y is lognormally distributed if its natural logarithm is normal: $InY \sim N(\mu, \sigma^2)$. A sample drawn from a lognormal population is described by $InY_i = \mu + \varepsilon_i$, $\varepsilon_i \sim n.i.d(0, \sigma^2)$.

fixed mean, the log-lin model permits mean stock price to vary systematically with some characteristic of an independent variable. According to Gujarati (2003: 179), in the log-lin model, the slope coefficient measures the constant proportional or relative change in regressand for a given absolute change in the value of the regressor. If multiplying by 100, the slope coefficient will then give the percentage change, or growth rate.

Table 6.2, Panel D, suggests that the mean (median) number of segments per firm is 2.8802(2.0000). In fact, the average number of business segments is 3.1174(3.0000), while that of geographical segments is only 2.0950(2.0000). Instead of using the number of segments only two segments, this study used three as the number of segments to avoid the effects on the second segment.

Further, Table 6.3 presents the correlation coefficients of variables for testing the value relevance of segment earnings.

Table 6.3 Correlation Coefficients[1] when Testing the Value Relevance of Segment Earnings

	$In\,\mathrm{Pr}\,ice_{it}$	BV_{it}	E_{it}	$e_{i,1,t}$	$e_{i,2,t}$	$e_{i,3,t}$	$Eli_{i,t}$	$other_{it}$
$In\,\mathrm{Pr}\,ice_{it}$	1 .	0.6705 0.0000	0.6340 0.0000	0.5347 0.0000	0.2910 0.0000	0.2081 0.0000	-0.1075 0.0005	-0.1440 0.0000
BV_{it}	0.7551 0.0000	1 .	0.5621 0.0000	0.5134 0.0000	0.4052 0.0000	0.1790 0.0000	-0.1060 0.0006	-0.2268 0.0000
E_{it}	0.7243 0.0000	0.6328 0.0000	1 .	0.5950 0.0000	0.3457 0.0000	0.2359 0.0000	-0.1191 0.0001	0.0792 0.0105
$e_{i,1,t}$	0.6250 0.0000	0.6570 0.0000	0.6752 0.0000	1 .	0.4185 0.0000	0.0881 0.0044	-0.2409 0.0000	-0.6462 0.0000
$e_{i,2,t}$	0.3335 0.0000	0.3995 0.0000	0.3348 0.0000	0.4121 0.0000	1 .	0.2318 0.0000	-0.0343 0.2678	-0.5873 0.0000
$e_{i,3,t}$	0.0247 0.4265	0.0280 0.3671	0.0683 0.0273	0.0760 0.0141	0.2502 0.0000	1 .	-0.0926 0.0028	-0.1797 0.0000
$Eli_{i,t}$	0.0482 0.1195	0.0492 0.1119	-0.0212 0.4947	-0.1153 0.0002	-0.1013 0.0011	-0.1798 0.0000	1 .	0.0090 0.7722
$other_{it}$	-0.1632 0.0000	-0.2676 0.0000	-0.0254 0.4128	-0.5504 0.0000	-0.4786 0.0000	-0.1904 0.0000	0.0416 0.1799	1 .

Notes: The data consists of 1,043 firm-year observations.

Table 6.3 (Continued)

1 Pearson correlation coefficients are in the upper-right of the table and Spearman correlation coefficients are in the lower-left of the table. P-values are below the correlation coefficients.

Definition of Variables:

$In\,\mathrm{Pr}\,ice_{it}$: the base-e logarithm of Price which is the price per share of firm i on the date of submitting financial statements to the SET ;

BV_{it} : book value of equity per share of firm i at the end of accounting period t;

E_{it} : the income before extraordinary items per share of firm i at the end of accounting period t;

$e_{i,j,t}$: the segment results per share of the segment j of firm i at the end of accounting period t; j =1, 2, and 3 are ranked by sales to apply a uniform regression model to the sample which consists of firms with a different segments;

$other_{it}$: the adjusted items making the sum of segment results equals the income before extraordinary items per share of firm i at the end of accounting period; this variable is calculated by using the E_{it} less the sum of segmented earnings; and

$Eli_{i,t}$: eliminated transaction in segment reports.

Pearson correlation coefficients in the upper-right and Spearman rank correlation coefficients in the lower-left are described in Table 6.3. All variables, except elimination transaction in segment reports ($Eli_{i,t}$) and the adjusted items ($other_{it}$), are positively correlated with security price ($In\,\mathrm{Pr}\,ice_{it}$). Although the correlation of some variables is more than 0.5 (for example, book value (BV_{it}) and aggregate earnings (E_{it}); book value (BV_{it}) and earnings of the largest segment ($e_{i,1,t}$); aggregate earnings (E_{it}) and earnings of the largest segment ($e_{i,1,t}$)), the

Variance Inflation Factor (VIF)[13] value is lower than 10. These results imply that multicollinearity between the independent variables is unlikely to pose a serious problem in the interpretation of the results from multivariate analysis.

Regression results for the relative usefulness between firm-level earnings and segmented earnings are presented in Table 6.4. The estimated coefficients are reported in Table 6.4 Panel A with t-statistics using the adjusted standard error. This is, because the estimated coefficients are likely to exhibit positive autocorrelation. Following prior studies (i.e. Kothari and Zimmerman, 1995: 170, Core, Guay and Buskirk, 2003: 43-67), this study corrects the standard errors using the Newey and West (1987) adjustment with six lags for serial dependence in the coefficients.[14] The results of the comparison of the adjusted-R^2, the AIC and BIC statistics are also presented in Table 6.4, Panel B.

[13] The VIF is a measure of the strength of the relationship between each explanatory variable and all other explanatory variables in the regression.

[14] Similar to the White (1980) standard error that is robust to heteroscedasticity for unknown form, the Newey-West standard error is robust to residual autocorrelation of unknown form. This standard error is consistent when the regression residuals are autocorrelated. Core, Guay and Buskirk, (2003: 54) indicates that if the residuals are not autocorrelated, the Newey-West standard error is the same as the OLS standard error. Hence, this study estimate the standard error using six lags based on the assumption that there is no correlation between residuals that are separated by more than six periods.

Table 6.4 Regression Results for Relative Usefulness of Firm-level Figures and Segment-level Figures (When Testing the Association between Price and Segmented Earnings)

Model 1[1] $$P_{it} = \alpha_{0t} + \alpha_{1t} BV_{it} + \alpha_{2t} E_{it} + \varepsilon_{it}$$

Model 2[1] $$P_{it} = \alpha_{0t} + \alpha_{1t} BV_{it} + \alpha_{2t} other_{it} + \alpha_{3t} Eli_{it} + \sum_{j=1}^{n} \alpha_{2+j,t} e_{i,j,t} + \varepsilon_{it}$$

Panel A: Relative Usefulness of Firm-level Figures and Segment-level Figures[2]

Coefficient Estimate of Model	Variable								Adjusted-R2	AIC	BIC
	Intercept	*BV*	*E*	*other*	*Eli*	e_1	e_2	e_3			
1	2.002 (37.069) .000	0.022 (13.832) .000	0.072 (10.950) .000						0.545 (625.736) .000	2.5181	2.5324
2	1.964 (37.008) .000	0.021 (14.024) .000		0.059 (8.522) .000	0.074 (4.338) .000	0.084 (12.322) .000	0.031 (2.856) .004	0.094 (7.429) .000	0.558 (220.660) .000	2.4925	2.5257

Panel B: Ranking of the Relative Usefulness of Firm-Level Figures and Segment-Level Figures

Approach	Ranking Preferred Model[3]	
	1st	2nd
1. Adjusted R2	Model 2	Model 1
2. AIC	Model 2	Model 1
3. BIC	Model 2	Model 1

Notes: The data consists of 1,043 firm-year observations.

Table 6.4 (Continued)

1 Each model uses the semi-log (log-lin models) or transforms P_{it} with the base-e logarithm ($In\,\Pr ice_{it}$) to get normality assumption and moderate the heteroskedasticity problem.

2 T-statistics are based on standard errors corrected for autocorrelation by the method of Newey and West (1987) with the lag of 6. Under this method, the estimator is given by $\sum_{NW} = \frac{T}{T-k}(X'X)^{-1}\hat{\Omega}(X'X)^{-1}$ where $\hat{\Omega} = \frac{T}{T-k}\left\{\sum_{t=1}^{T} u_t^2 x_t x_t' + \sum_{v=1}^{q}((1-\frac{v}{q+1})\sum_{t=\vartheta+1}^{T}(x_t u_t u_{t-v} x_{t-v'} + x_{t-v} u_{t-v} u_t x_t')\right\}$; T is the number of observations; k is the number of regressors; and q, the truncation lag, is a parameter representing the number of autocorrelations used in evaluating the dynamic of *OLS* Residuals u_t.

3 On the basis of one or more of these criteria, a model finally selected has the highest adjusted-R2 or the lowest value of AIC and BIC

Definition of Variables:

P_{it} : the price per share of firm i on the date of submitting financial statements to the SET ;

$In\,\Pr ice_{it}$: the base-e logarithm of P_{it} which is the price per share of firm i on the date of submitting financial statements to the SET;

Table 6.4 (Continued)

BV_{it} : book value of equity per share of firm i at the end of accounting period t;

E_{it} : the income before extraordinary items per share of firm i at the end of accounting period t;

$e_{i,j,t}$: the segment results per share of the segment j of firm i at the end of accounting period t; j=1, 2, and 3 are ranked by sales to apply a uniform regression model to the sample which consists of firms with a different segments;

$other_{it}$: the adjusted items making the sum of segment results equals the income before extraordinary items per share of firm i at the end of accounting period, ; this variable is calculated by using the E_{it} less the sum of segmented earnings;

$Eli_{i,t}$: Eliminated transaction in segment reports;

AIC : Akaike Information Criterion = $-2(l/T)+2(k/T)$; and

BIC : Bayesian Information Criterion or Schwarz Criterion = $-2(l/T)+k\log(T)/T$ where l: the value of log of the likelihood function with the k parameters estimated using T observations. The various information criteria are all based on -2 times the average log likelihood function, adjusted by a penalty function

As reflected in Panel A of Table 6.4, Model 1 provides the value relevance of book value and earnings by running stock price against book value and net income. While Model 2 provides an overall test of incremental value-relevance by estimating the relation between stock price against book value and segment earnings. All models are significant at the 0.01 level. When considering the coefficients for each variable of Model 1, the results indicate that both book value and earnings are value relevant. Similarly, the results of all coefficients in Model 2 are significant and reveal that investors consider the amount of the segment earnings for setting the security prices. That is, there is marginal value relevance in the segment earnings. According to Panel B of Table 6.4, the model of segment earnings increases the adjusted-R^2 to 0.558. The result is supported by the AIC and BIC statistics which show that segment earnings have more explanatory power than firm-level earnings does.

In conclusion, this section provides significant evidence for the value relevance of segment earnings in explaining security price. The market either uses the segment earnings in valuing security prices or the disclosure of segment earnings in correlation with the underlying information set in valuing security prices.

6.2 Is Future Performance More Strongly Associated with Segment Reporting Information Than with Aggregated Information?

The objective of this question is to investigate the association of segmental disclosures of Thai listed companies with the firm's future performance. In fact, past performance is often a good indicator of future performance. Investors or creditors look at the trend of past sales, or past earnings not only as a means for judging management's past performance but also as a possible indicator of future performance. When most companies today operate in more than one industry or one location, the first hypothesis of Section 6.2 is used to test the association of segment earnings with future earnings while the other is used to test the association of segment sales with future sales. The empirical findings of each hypothesis are discussed in Section 6.2.1 and 6.2.2, respectively.

6.2.1 The Association of Segment Earnings with Future Earnings

This study investigates whether future earnings should be more strongly associated with segment earnings than with consolidated earnings. In addition to the sample selection in Chapter 4, this study restricts itself to firms having segment data for a minimum of three years. This is, because the dependent variable is future earnings, the independent variable is current earnings, and the deflated variable is total asset at the prior fiscal year. To reduce the effects of uncontrollable, only firms that did not significantly change their reporting practices are included in this study. This leads to the exclusion of firms changing their segments or their format of reported multi-segments (geographical segments, line of business segments, or both), or changing their reportable segments from reported multi-segments to reported single-segment, etc. In addition, this study deletes firms which added new segments or reduced the number of reportable segments. The year 1994 is the first fiscal year in which many listed companies included segment information in their financial statements, and the year 2005 is the final period in which this study collected sample data. The independent variables are thus collected from the period 1995 to 2004. Table 6.5 presents the number of firms which are used to examine the association of segment earnings with future earnings.

Table 6.5 Number of Firms in Sample when Considering the Association of Segment Earnings with Future Earnings

Firms having segment information as either industry segments or geographical segments and having segment data for a minimum of three years	992
Minus Firms with missing segment earnings, or uncompleted data[1].	167
The remaining number of sample	825
Minus Firms adding new segments or reducing the numbers of segments	221
Minus Outliers and Influential Observations[2]	32
Total number of samples	572

Notes: 1 Firms with uncompleted data: firms voluntarily disclose geographical segment information as city in Thailand, firms with consolidated data but show segmental information by using only the data of parent company.

Table 6.5 (Continued)

2 Outliers and influential observations are defined as data points having the leverage value more than $2p/n$ and having the absolute value of *DIFFITS* (the difference between predicted observation without the i^{th} observation deleted and predicted observation with i^{th} observation deleted) more than $2\sqrt{p/n}$ based on each pair model which are compared; where p : number of regression coefficients and n is sample size. The observations having the absolute value of studentized deleted residuals more than 3 also are deleted.

There are 572 firm-year observations which are included in this study. Table 6.6 presents the descriptive statistics for all dependent and independent variables. The simple statistics for each variable is also presented by types of segments (business segments and/or geographical segments) to examine for any pattern which may be present for each variable. To apply a uniform regression model to the sample which consists of firms with different segments, this study uses sales to rank segments. The average of the number of segments per firm is stated in Table 6.6, Panel D.

Table 6.6 Database and Sample Descriptive Statistics for Testing Association of Segment Earnings with Future Earnings

Panel A: Descriptive Statistics of Total Sample

	E_{it+1}	E_{it}	$e_{i,1,t}$	$e_{i,2,t}$	$e_{i,3,t}$	$Eli_{i,t}$	$other_{it}$
N	572	572	572	572	572	572	572
Mean	0.0725	0.0694	0.0875	0.0205	0.0056	-0.0012	-0.0431
Median	0.0773	0.0772	0.0718	0.0110	0.0000	0.0000	-0.0229
Std. Deviation	0.1005	0.1099	0.1025	0.0514	0.0377	0.0180	0.1174
Minimum	-0.4326	-0.4918	-0.3076	-0.2201	-0.5582	-0.2113	-1.5505
Maximum	0.4218	0.4218	0.8291	0.8021	0.5268	0.2808	0.3761

Table 6.6 (Continued)

Panel B: Descriptive Statistics of Firms Reporting Segments as Business Segments

	E_{it+1}	E_{it}	$e_{i,1,t}$	$e_{i,2,t}$	$e_{i,3,t}$	$Eli_{i,t}$	$other_{it}$
N	424	424	424	424	424	424	424
Mean	0.0635	0.0604	0.0756	0.0173	0.0062	-0.0004	-0.0385
Median	0.0699	0.0684	0.0598	0.0103	0.0000	0.0000	-0.0205
Std. Deviation	0.1000	0.1123	0.0928	0.0383	0.0355	0.0171	0.1055
Minimum	-0.4326	-0.4918	-0.2948	-0.1628	-0.5582	-0.0795	-0.5349
Maximum	0.4218	0.4218	0.6375	0.2586	0.1798	0.2808	0.3761

Panel C: Descriptive Statistics of Firms Reporting Segments as Geographical Segments

	E_{it+1}	E_{it}	$e_{i,1,t}$	$e_{i,2,t}$	$e_{i,3,t}$	$Eli_{i,t}$	$other_{it}$
N	148	148	148	148	148	148	148
Mean	0.0984	0.0953	0.1216	0.0294	0.0040	-0.0035	-0.0562
Median	0.0943	0.0969	0.1129	0.0173	0.0000	0.0000	-0.0499
Std. Deviation	0.0977	0.0986	0.1201	0.0769	0.0433	0.0202	0.1460
Minimum	-0.2505	-0.2397	-0.3076	-0.2201	-0.0057	-0.2113	-1.5505
Maximum	0.3322	0.3631	0.8291	0.8021	0.5268	0.0089	0.1887

Panel D: Numbers of Segments in Sample

	Total Sample	**Business Segments**	**Geographical Segments**
N	572	424	148
Mean	2.7395	2.9670	2.0878
Median	2.0000	3.0000	2.0000
Std. Deviation	1.1262	1.2102	0.3675
Minimum	2.0000	2.0000	2.0000
Maximum	8.0000	8.0000	4.0000

Note: The data consists of 572 firm-year observations.

Definition of Variables:

E_{it+1} : the operating earnings of firm i at the end of accounting period $t+1$.

E_{it} : the operating earnings of firm i at the end of accounting period t ;

$e_{i,j,t}$: the segment results of the segment j of firm i at the end of accounting period t; j =1, 2, and 3 are ranked by sales to apply a uniform regression model to the sample which consists of firms with a different segments;

Table 6.6 (Continued)

$other_{it}$: the adjusted items making the sum of segment results equals the income before extraordinary items per share of firm i at the end of accounting period the operating earnings less the sum of segmented earnings**;**

$Eli_{i,t}$: Eliminated transaction in segment reports.

All variables are deflated by the total assets of firm i at the prior fiscal year.

Table 6.6 details the descriptive statistics concerning the variables used in the models. All variables are deflated by total assets at the prior fiscal year. The variables are arranged in such a way that the components of operations are broken down to individual segment earnings, eliminated transaction, and the adjusted items. Because each firm reports segment earnings using a different definition, this study defined adjusted items as the difference between operating earnings and segment earnings. All variables, except the eliminated transaction and adjusted items, are positive. The 572 firm-year observations consist of 424 firms reporting business segments, and 148 firms reporting geographical segments.

Table 6.6, Panel D, indicates that the mean (median) number of segments per firm is 2.7395(2.0000). In fact, the average number of business segments is 2.9670(3.0000), while that of geographical segments is only 2.0878(2.0000). Instead of using the number of segments only two segments, this study uses the number of segments as three to avoid the effects on the second segment.

The correlation matrix between all the explanatory variables used in this analysis is presented in Table 6.7 as follows.

Table 6.7 Correlation Coefficients[1] when Testing for Testing Association of Segment Earnings with Future Earnings

	E_{it+1}	E_{it}	$e_{i,1,t}$	$e_{i,2,t}$	$e_{i,3,t}$	$Eli_{i,t}$	$other_{it}$
E_{it+1}	1 .	0.6889 0.0000	0.4228 0.0000	0.1673 0.0001	0.1568 0.0002	-0.1831 0.0000	0.1807 0.0000
E_{it}	0.6490 0.0000	1 .	0.5459 0.0000	0.2589 0.0000	0.1367 0.0010	-0.1513 0.0003	0.3260 0.0000
$e_{i,1,t}$	0.4349 0.0000	0.6033 0.0000	1 .	0.3805 0.0000	-0.0672 0.1082	-0.0613 0.1431	-0.4970 0.0000
$e_{i,2,t}$	0.1785 0.0000	0.2801 0.0000	0.2907 0.0000	1 .	0.1308 0.0017	-0.1127 0.0070	-0.5519 0.0000
$e_{i,3,t}$	-0.0023 0.9568	0.0471 0.2613	0.0230 0.5832	0.1996 0.0000	1 .	-0.7290 0.0000	-0.0798 0.0566
$Eli_{i,t}$	-0.0590 0.1591	-0.0713 0.0887	-0.1244 0.0029	-0.1133 0.0067	-0.1613 0.0001	1 .	0.0421 0.3151
$other_{it}$	0.2053 0.0000	0.3097 0.0000	-0.3910 0.0000	-0.2828 0.0000	-0.1069 0.0105	0.0273 0.5143	1 .

Notes: The data consists of 572 firm-year observations.

1 Pearson correlation coefficients are in the upper-right of the table and Spearman correlation coefficients are in the lower-left of the table. P-values are below the correlation coefficients.

Definition of Variables:

E_{it+1} : the operating earnings of firm i at the end of accounting period $t+1$.

E_{it} : the operating earnings of firm i at the end of accounting period t ;

$e_{i,j,t}$: the segment results of the segment j of firm i at the end of accounting period t; j =1, 2, and 3 are ranked by sales to apply a uniform regression model to the sample which consists of firms with a different segments;

$other_{it}$: the adjusted items making the sum of segment results equals the income before extraordinary items per share of firm i at the end of

Table 6.7 (Continued)

accounting period the operating earnings less the sum of segmented earnings**;**

$Eli_{i,t}$: Eliminated transaction in segment reports.

All variables are deflated by the total assets of firm i at the prior fiscal year.

Table 6.7 presents correlation coefficients in the upper-right and Spearman rank correlation coefficients in the lower-left portion of the table. The correlations among independent variables are lower than 0.5, except the correlations between aggregate earnings (E_{it}) and the first segment earnings ($e_{i,1,t}$); the adjusted items ($other_{it}$) and the second largest segment ($e_{i,2,t}$); the third segment and the eliminated transaction ($Eli_{i,t}$). However, the VIF is lower than 10. Multicollinearity among the independent variables is thus unlikely to pose a problem in the interpretation of the results in this section.

Table 6.8 describes regression results for the relative usefulness between aggregate earnings and segment earnings by examining whether future earnings should be more strongly associated with segment earnings than with consolidated earnings. The estimated coefficients are reported in Table 6.8, Panel A with t-statistics uses the adjusted standard error, because the estimated coefficients are likely to have the heteroscedasticity problem. This study corrects the standard errors using White's heteroscedasticity consistent covariance matrix estimator. Gujarati (2003: 417) indicates that White's heteroscedasticity-corrected standard errors are considerably larger than the OLS standard errors and therefore the estimated t-values are much smaller than those obtained by OLS. On the basis of the latter, both regressors are statistically significant at the 5 percent level, whereas on the basis of White's heteroscedasticity-corrected standard errors they can be larger or smaller than the uncorrected standard errors.

Table 6.8 Regression Results for Relative Usefulness of Firm-level Figures and Segment-level Figures (When Testing the Association between Future Earnings and Segmented Earnings)

Model 3 $E_{it+1} = \alpha_{0t} + \alpha_{1t} E_{it} + \varepsilon_{it}$

Model 4 $E_{it+1} = \alpha_{0t} + \alpha_{1t} other_{it} + \alpha_{2t} Eli_{it} + \sum_{j=1}^{n} \alpha_{j+2,t} e_{i,j,t} + \varepsilon_{it}$

Panel A: Relative Usefulness of Firm-level Figures and Segment-level Figures[1]

Coefficient Estimate of Model	Variable							Adjusted-R2	AIC	BIC
	Intercept	*E*	*other*	*Eli*	e_1	e_2	e_3			
	0.029	0.630						0.474		
3	(6.647)	(16.710)						(514.960)	-2.3961	-2.3809
	.000	.000						.000		
	0.026		0.581	0.262	0.671	0.495	0.688	0.482		
4	(5.546)		(14.269)	(0.991)	(15.656)	(6.861)	(5.551)	(107.155)	-2.4045	-2.3589
	.000		.000	.322	.000	.000	.000	.000		

Panel B: Ranking of the Relative Usefulness of Firm-Level Figures and Segment-Level Figures

Approach	Ranking Preferred Model[2]	
	1st	2nd
1. Adjusted R2	Model 4	Model 3
2. AIC	Model 4	Model 3
3. BIC	Model 3	Model 4

Notes: The data consists of 572 firm-year observations.

Table 6.8 (Continued)

1 T-statistics are based on standard errors corrected for heteroscedasticity by the method of White's (1980) corrected standard error estimates, the estimator is given by $\sum_W = \frac{T}{T-K}(X'X)^{-1}(\sum_{t=1}^{T} u_t^2 x_t x_t')(X'X)^{-1}$ where is T is the number of observations; K is the number of regressors; and u_t is the least squares residual.

2 On the basis of one or more of these criteria, a model finally selected has the highest adjusted-R2 or the lowest value of AIC and BIC.

Definition of Variables:

E_{it+1} : the operating earnings of firm i at the end of accounting period $t+1$.

E_{it} : the operating earnings of firm i at the end of accounting period t ;

$e_{i,j,t}$: the segment results of the segment j of firm i at the end of accounting period t; j=1, 2, and 3 are ranked by sales to apply a uniform regression model to the sample which consists of firms with a different segments;

$other_{it}$: the adjusted items making the sum of segment results equals the income before extraordinary items per share of firm i at the end of accounting period the operating earnings less the sum of segmented earnings;

$Eli_{i,t}$: Eliminated transaction in segment reports.

All variables are deflated by the total assets of firm i at the prior fiscal year.

Table 6.8 (Continued)

AIC : Akaike Information Criterion = $-2(l/T)+2(k/T)$; and

BIC : Bayesian Information Criterion or Schwarz Criterion = $-2(l/T)+k\log(T)/T$ where l : the value of log of the likelihood function with the k parameters estimated using T observations. The various information criteria are all based on -2 times the average log likelihood function, adjusted by a penalty function.

Table 6.8, Panel A, suggests that Model 3 provides the association between future earnings and current earnings by running future earnings against current earnings, while Model 4 provides an overall test by estimating the relation between future earnings against segment earnings. The standard F-test is used to test whether the estimated coefficients are equal across segments. If the estimated coefficients are significant differently across segments, then this difference would suggest that segment earnings are reflected in future performance and that such disclosures are useful. All models are significant at the 0.01 level. When considering the coefficients for current earnings from Model 3, the results indicate that the average adjusted-R^2 is 0.473, the average slope coefficient for current earnings is 0.630.

In contrast, Model 4 increases the mean adjusted-R^2 to 0.482. The average coefficient for the earnings of the largest segment is 0.671, earnings of the second largest segment is 0.495, earnings of the third largest segment is 0.688, eliminated transaction is 0.262, and the adjusted items is 0.581. All coefficients are significant at the 0.01 level, except for that that of the eliminated transaction. These results reveal that there is an association between the amount of segment information and future earnings.

When considering two alternative models, the results in Panel B of Table 6.8 show that the model of segment earnings increases the adjusted-R^2 from 0.473 (Model 3) to 0.482 (Model 4). This result is supported by the AIC statistics which show that segment earnings are more associated with future earnings than with firm-level earnings. However, the BIC statistics show that the Model of aggregate earnings are more associated with future earnings than with the Model of segment earnings. It is possible that the increase in explanatory power measured by the adjusted-R^2 and the AIC statistics attributes from the number of regressors added to the model. These results are weakly supported in that the segment earnings are more associated with future earnings than with aggregate earnings.

Overall, the results of Table 6.8 can be summarized by stating that segment earnings are useful, but the hypothesis that segment earnings are more strongly associated with future earnings than aggregate earnings is only weakly supported by the results from the BIC statistics.

6.2.2 The Association of Segment Sales with Future Sales

This study investigates whether future sales are more strongly associated with segment sales than with aggregate sales. This study is restricted to firms having segment data for a minimum of three years, because the dependent variable is future sales, and the independent variable is current sales. To reduce the effects of uncontrollable, only firms that did not significantly change their reporting practices are included in this study. Besides, this study deletes firms which added new segments or reduce the number of reportable segments.

The year 1994 is the first fiscal year in which many listed firms included segment information in their financial statements, with the year 2005 as the final period in which this study collected sample data. The independent variable data is thus collected from the period 1995 to 2004. Table 6.9 presents the number of firms which was used to examine the association between segment sales and future sales.

Table 6.9 Number of Firms in Sample when Considering the Association of Segment Sales with Future Sales

Firms having segment information as either industry segments or geographical segments and having segment data for a minimum of two years	990
Minus Firms with missing segment sales, or uncompleted data[1].	136
The remaining number of sample	854
Minus Firms adding new segments or reducing the numbers of segments	101
Minus Outliers and Influential Observations[2]	47
Total number of samples	706

Notes: 1 Firms with uncompleted data: firms voluntarily disclose geographical segment information as city in Thailand, firms with consolidated data but show segmental information by using only the data of parent company.

2 Outliers and influential observations are defined as data points having the leverage value more than $2p/n$ and having the absolute value of $DIFFITS$ (the difference between predicted observation without the i^{th} observation deleted and predicted observation with i^{th} observation deleted) more than $2\sqrt{p/n}$ based on each pair model which are compared; where p : number of regression coefficients and n is sample

Table 6.9 (Continued)

size. The observations having the absolute value of studentized deleted residuals more than 3 also are deleted.

There are 706 firm-year observations that are included in this study. Table 6.10 presents the descriptive statistics for all dependent and independent variables. The simple statistics for each variable is also presented by types of segments (business segments and/or geographical segments) which is used to examine for any pattern for each variable. To apply a uniform regression model to the sample which consists of firms having different segments, this study ranks segments by sales. The overall average number of segments per firm is stated in Table 6.10, Panel D.

Table 6.10 Database and Sample Descriptive Statistics for Testing Association of Segment Sales with Future Sales

Panel A: Descriptive Statistics of Total Sample

	S_{it+1}	S_{it}	$s_{i,1,t}$	$s_{i,2,t}$	$s_{i,3,t}$	Eli_{it}
N	706	706	706	706	706	706
Mean	1.0697	1.0917	0.8418	0.2329	0.0396	-0.0225
Median	1.0654	1.0679	0.8166	0.2063	0.0000	0.0000
Std. Deviation	0.2079	0.2643	0.2981	0.1669	0.0926	0.0726
Minimum	0.3740	0.2134	0.1114	0.0002	0.0000	-0.9791
Maximum	1.7614	3.0354	3.0665	0.8405	0.6931	0.0000

Panel B: Descriptive Statistics of Firms Reporting Segments as Business Segments

	S_{it+1}	S_{it}	$s_{i,1,t}$	$s_{i,2,t}$	$s_{i,3,t}$	Eli_{it}
N	443	443	443	443	443	443
Mean	1.0631	1.0841	0.8135	0.2266	0.0021	0.0619
Median	1.0657	1.0660	0.7868	0.2052	0.0000	0.0026
Std. Deviation	0.2222	0.2729	0.2866	0.1601	0.1099	0.1099
Minimum	0.3740	0.2134	0.1114	0.0002	0.0000	0.0000
Maximum	1.7614	2.3111	1.8796	0.8405	0.6931	0.6931

Table 6.10 (Continued)

Panel C: Descriptive Statistics of Firms Reporting Segments as Geographical Segments

	S_{it+1}	S_{it}	$s_{i,1,t}$	$s_{i,2,t}$	$s_{i,3,t}$	Eli_{it}
N	263	263	263	263	263	263
Mean	1.0810	1.1045	0.8896	0.2435	0.0021	0.0021
Median	1.0628	1.0711	0.8504	0.2155	0.0000	0.0000
Std. Deviation	0.1810	0.2493	0.3113	0.1776	0.0208	0.0208
Minimum	0.4755	0.2682	0.1981	0.0008	0.0000	0.0000
Maximum	1.6342	3.0354	3.0665	0.7983	0.3161	0.3161

Panel D: Numbers of Segments in Sample

	Total Sample	**Business Segments**	**Geographical Segments**
N	706	443	263
Mean	2.6119	2.9436	2.0532
Median	2.0000	3.0000	2.0000
Std. Deviation	1.0530	1.1916	0.2979
Minimum	2.0000	2.0000	2.0000
Maximum	8.0000	8.0000	4.0000

Note: The data consists of 706 firm-year observations.

Definition of Variables:

S_{it+1} : the consolidated of firm i at the end of accounting period $t+1$;

S_{it} : the consolidated sales of firm i at the end of accounting period t;

$s_{i,j,t}$: the segment sales the segment j of firm i at the end of accounting period t; j =1, 2, and 3 are ranked by sales to apply a uniform regression model to the sample which consists of firms with a different segments;

$Eli_{i,t}$: Eliminated transaction in segment reports; and

All variables are deflated by the sales of firm i at the prior fiscal year.

Table 6.10, Panels A, B and C show the descriptive statistics of the variables used in the models. All variables were deflated by sales at the prior fiscal year.[15] The variables are arranged in such a way that the components of the primary operating measure (sales) are broken down to individual segment sales, and eliminated transactions. All variables, except eliminated transactions, are positive. The 706 firm-year observations consist of 443 firms reporting by business segments, and 263 firms reporting by geographical segments.

Table 6.10, Panel D, indicates that the mean (median) number of segments per firm is 2.6119(2.0000). In fact, the average number of business segments is 2.9436(3.0000), while that of geographical segments is only 2.0532(2.0000). Instead of using the number of segments only two segments, this study fixed the number of segments at three to avoid the effects on the second segment.

The correlation matrix between all the explanatory variables used in the analysis is presented in Table 6.11 as follows.

Table 6.11 Correlation Coefficients[1] when Testing the Value Relevance of Segment Sales

	S_{it+1}	S_{it}	$s_{i,1,t}$	$s_{i,2,t}$	$s_{i,3,t}$	$Eli_{i,t}$
S_{it+1}	1 .	0.2495 0.0000	0.1928 0.0000	0.0453 0.2291	-0.0009 0.9810	0.0140 0.7101
S_{it}	0.2474 0.0000	1 .	0.7326 0.0000	0.2569 0.0000	0.1239 0.0010	-0.1209 0.0013
$s_{i,1,t}$	0.1714 0.0000	0.6024 0.0000	1 .	-0.3740 0.0000	-0.2661 0.0000	-0.2366 0.0000
$s_{i,2,t}$	0.0432 0.2512	0.2463 0.0000	-0.4734 0.0000	1 .	0.2065 0.0000	-0.0890 0.0180
$s_{i,3,t}$	-0.0169 0.6542	0.0241 0.5220	-0.3197 0.0000	0.2114 0.0000	1 .	-0.2069 0.0000
$Eli_{i,t}$	-0.0047 0.9016	-0.1173 0.0018	-0.1603 0.0000	-0.0629 0.0952	-0.1593 0.0000	1 .

[15] This study uses the book value/total asset of firm i at the prior fiscal year, but the models have met the heteroskedasticity problem. The interpretation of models using sales is different from that of models using total assets or book value as deflator. Under model of using sales at prior fiscal sales, this study interprets as the proportion of sales of firm i at the end of accounting period t against sales of firm i at the prior fiscal year.

Table 6.11 (Continued)

Notes: The data consists of 706 firm-year observations.

1 Pearson correlation coefficients are in the upper-right of the table and Spearman correlation coefficients are in the lower-left of the table. P-values are below the correlation coefficients.

Definition of Variables:

S_{it+1} : the consolidated of firm i at the end of accounting period $t+1$;

S_{it} : the consolidated sales of firm i at the end of accounting period t;

$s_{i,j,t}$: the segment sales the segment j of firm i at the end of accounting period t; j =1, 2, and 3 are ranked by sales to apply a uniform regression model to the sample which consists of firms with a different segments;

$Eli_{i,t}$: Eliminated transaction in segment reports; and

All variables are deflated by the sales of firm i at the prior fiscal year.

Table 6.11 presents correlation coefficients in the upper-right and Spearman rank correlation coefficients in the lower-left portion of the table. The correlations among independent variables are lower, i.e. 0.5, except the correlations between the aggregate sales and the first segment sales ($s_{i,1,t}$). This is, because this study uses sales to rank segments in order to apply a uniform regression model. Further, sales of the largest segment ($s_{i,1,t}$) with the second segment ($s_{i,2,t}$) and with the third segment ($s_{i,3,t}$) is negative. This is probably due to the fact that if the sales of any segments are generally reduced, companies find it necessary to increase the sales of another segment to maximize their wealth.

Moreover, to avoid multicollinearity between the independent variables, this study developed a model to test the association between future sales and aggregate sales and a competing model to test the association between future sales and segment sales. This study then examined whether future sales should be more strongly

Table 6.12 Regression Results for Relative Usefulness of Firm-level Figures and Segment-level Figures (When Testing the Association between Future Sales and Segmented Sales)

Model 5 $S_{it+1} = \alpha_{0t} + \alpha_{1t} S_{it} + \varepsilon_{it}$

Model 6 $S_{it+1} = \alpha_{0t} + \alpha_{1t} Eli_{it} + \sum_{j=1}^{n} \alpha_{j+1,t} s_{i,j,t} + \varepsilon_{it}$

Panel A: Relative Usefulness of Firm-level Figures and Segment-level Figures

Coefficient Estimate of Model	Variable						Adjusted-R2	AIC	BIC
	Intercept	S	Eli	s_1	s_2	s_3			
	0.856	0.196					0.061		
5	(26.534)	(6.836)					(46.726)	-0.3636	-0.3507
	.000	.000					.000		
	0.854		0.319	0.205	0.188	0.155	0.060		
6	(26.349)		(2.795)	(6.851)	(3.748)	(1.746)	(12.191)	-0.3581	-0.3258
	.000		.005	.000	.000	.081	.000		

Panel B: Ranking of the Relative Usefulness of Firm-Level Figures and Segment-Level Figures

Approach	Ranking Preferred Model[1]	
	1st	2nd
1. Adjusted R2	Model 5	Model 6
2. AIC	Model 5	Model 6
3 BIC	Model 5	Model 6

Notes: The data consists of 706 firm-year observations.

Table 6.12 (Continued)

1 On the basis of one or more of these criteria, a model finally selected has the highest adjusted-R2 or the lowest value of AIC and BIC.

Definition of Variables:

S_{it+1} : the consolidated of firm i at the end of accounting period $t+1$;

S_{it} : the consolidated sales of firm i at the end of accounting period t;

$s_{i,j,t}$: the segment sales the segment j of firm i at the end of accounting period t; j=1, 2, and 3 are ranked by sales to apply a uniform regression model to the sample which consists of firms with a different segments;

$Eli_{i,t}$: Eliminated transaction in segment reports.

All variables are deflated by the sales of firm i at the prior fiscal year.

AIC : Akaike Information Criterion = $-2(l/T)+2(k/T)$; and

BIC : Bayesian Information Criterion or Schwarz Criterion = $-2(l/T)+k\log(T)/T$ where l: the value of log of the likelihood function with the k parameters estimated using T observations. The various information criteria are all based on -2 times the average log likelihood function, adjusted by a penalty function.

associated with segment sales than with consolidated sales. The estimated coefficients are reported in Table 6.12, Panel A, while the results on the comparison of the adjusted-R^2, the AIC and BIC statistics are presented in Table 6.12, Panel B.

The results of the regression models are shown in Table 6.12. Model 5 provides the association between future sales and current sales by running future sales against current sales, while Model 6 provides an overall test of the incremental value-relevance by estimating the relation between future sales against segment sales. Both models have significant explanatory power. When considering the coefficients for each model, the results indicate that all coefficients are significant. Hence, the amount of sales information, both aggregate sales and segment sales, are associated with future performance.

Table 6.12, Panel B, also mentions that when considering two alternative models, the average adjusted-R^2 of segment sales (Model 6 is 0.060) is less than that of aggregate sales (Model 5 is 0.061), the result is consistent with the AIC and BIC statistics. Therefore, the hypothesis that the segment sales are more associated with future sales than with aggregate sales is not supported.

A possible explanation is that sales information is a primary performance measure and difficult to manipulate, compared with earnings information. The sales of any company is also dependent on the economic environment. However, this study cannot provide the external data[16], like the prior literatures in foreign countries (e.g. Kinney, 1971: 127-136; Collins 1976: 163-177; Balakrishnan, Harris and Sen 1990: 305-325, etc.). These prior studies indicate that business segment disclosures, together with industry sales projections published in various government sources, provide significantly more accurate estimates of future total-entity sales and earnings than do those procedures that rely totally on consolidated data, while the studies on

[16] When reviewing the segmental disclosures of Thai listed companies, most companies only disclosed that they operate in Thailand, and in foreign countries. The number of sample firms that disclose on a continent-by-continent basis, or on country-by-country basis is limited. Therefore, it is difficult to use the forecasts of Gross National Product (GNP) that are only available for individual countries. Similarly, the development of the segment-based prediction model is limited by the industrial statistics presently published in Thailand, unlike such development of Kinney (1971: 127-136), and Collins (1976:163-177). They employ the U.S. Industrial Outlook, which the Business and Defense Service Administration of the U.S. Department of Commerce makes available annually predictions of the "value of shipments" by industry for the coming year, as one source of industry prediction.

geographical disclosures use the performance of the economies of specific countries or geographic regions. Hence, the hypothesis that future sales are more strongly associated with segment sales than aggregate sales is not supported.

CHAPTER 7

CONCLUSIONS AND IMPLICATIONS

The purpose of this study is to examine the segment reporting practices of Thai listed companies and the quality of segment information that they announce. In terms of segment reporting in practice, this study examines the extent of compliance with the existing segment reporting standard and investigates whether segment disclosures in the notes of financial statements are consistent with those in other parts of the annual reports. In contrast, under the quality of segment information, this study considers whether segment data provides incremental information beyond that contained in the firm level data and whether the segment reporting information is more associated with future performance than with firm level data.

7.1 Segment Reporting in Practice in Thailand

Reporting firm data disaggregated by segment has been a debated issue since 1994. This period was the first time that the ICAAT issued an accounting standard on segment reporting. Before the year 1994, the absence of a significant accounting standard with regard to segment reporting led to a lack of guidelines to use when firms disclosed segment information in practice. In addition, the disclosure of segment information has a direct monetary cost, in particular, the value of the resources used in gathering and processing the information and in its audit and communication. An important issue is that voluntary segmental disclosure will also place individual companies at a competitive disadvantage. Consistent with the results of this study, hardly any listed companies voluntarily reported segment reporting in the notes of financial statements before TAS No.24 became effective (1992-1993).

When TAS No.24 was officially promulgated in Thailand in 1994, the tendency of firms disclosing segment information as a topic in financial statements grew

remarkably, especially the number of firms which reported information by multi-segments in the notes of financial statements which was greater than that of firms which reported information by single segments (including firms not reporting any segments in notes of financial statements) since the year 1998 until now. This result implies that either most companies in the Thai capital market have increasingly diversified their operations into different industries, or the important role of segment reporting has been realized and implemented after being issued for a period of time. Therefore, this study investigates the implementation of TAS No.24 with the financial statements of listed companies in the Thai capital market, especially with regard to the determination of material segments (i.e. business segments, geographical segments, and both dimensions) and the accounting information disclosed in segment reports, in order to provide a better understanding about segment reporting practices and improve disclosure requirements.

In general, TAS No.24 requires that industry segments and geographical segments be usual based on the presentation information on operations by segments. This study further investigates multi-segment firms and finds that most companies decided to disclose their segmental information by industry lines rather than by geographical areas. In addition, the distribution of firms presenting segment reporting shows that the proportion of firms in the property and construction industry has the highest percentages of presenting multi-segment information. When investigating the distribution of multi-segment firms using the segment format, this study found that most firms in the service industry always preferred to group operation segments by business segments. In contrast, firms in the consumer product industry and in the agro and food industry preferred to classify their segments by geographical regions, while most firms in the property and construction industry, the industrial industry, and the consumer products industry presented segment information by using both dimensions.

In addition, the empirical evidence shows that a few listed companies identified their segments as individual countries or groups of countries within particular geographical areas (as defined by paragraph 4 of TAS No.24). On the contrary, most listed companies defined their geographical segments broadly (i.e. “in country/Thailand” and “in foreign countries”, with no disaggregation of “in foreign countries”). This result implies that the identification of geographical segments by

each Thai listed company inadequately identifies the scope of the company's international operations. It is possible that the firm's operation in each specific country is not considered "material", i.e. the size of business is less than the ten percent threshold. Paragraph 14 of the TAS No.24 provides general guidelines that state that the materiality of the segment could based on ten percent of consolidated revenue, operating profit or total assets. Allowing management to exercise its judgment to choose its ten percent threshold increases flexibility but it could result in inconsistency in segmental disclosures among firms in the same industries. In addition, paragraph 10 of the TAS No.24 explains that a firm could disclose domestic sales and foreign sales separately. This leads some firms to minimally disclose geographical segment only as "in country/ Thailand" and "in foreign countries" rather than disclose sales in individual country. Finally, managers may want to avoid releasing crucial competitive information (i.e. market or production locations) to the public, including competitors. It is questionable that identifying broad geographic areas would make segmental information become less meaningful to the financial statement users.

This study also examines the accounting items: (a) segment sales, (b) segments results, (c) segment assets as required by TAS No.24, the results show that most firms disclose segmental sales and are not likely to disclose segment profits and segment assets. Although TAS No.24 requires companies to disclose segment revenue, segment income, segment assets, most listed companies still have poor segment reporting compliance with the TAS No.24 standard, specifically firms reporting segments by geographical area. Certainly, the empirical evidence shows that some companies express their concerns in the notes of financial statements by stating that disclosing segmental income could endanger its business once the trade counter party finds out segment profit margin. Disclosing performance by product line or geographical area may highlight opportunities previously unknown to competitors, thereby undermining a company's competitive advantage. Segment disclosure may also weaken an enterprise' competitive position, if more detailed information is made available to competitors, customers, suppliers, and others. Once too much information is revealed, the company could lose its power of negotiation. This leads management to withhold certain segment information.

The problems of reporting segment assets may also arise when a firm employs common assets which are shared by two or more segments. Paragraph 18 of TAS No.24 addresses this issue and suggests that these assets should be allocated between or among segments using a reasonable basis. The subjectivity and difficulty of asset allocation could hinder segment asset disclosure.

Besides considering the implementation of TAS No.24 with regard to the determination of segments and the segment disclosure compliance, this study also investigate whether listed companies voluntarily applied TAS No. 50. The ICCAT aimed to substitute TAS No.50 for TAS No.24, but it appeared that TAS No.50 was not approved and placed into law, as required by the Accountancy Act B.E. 2543. TAS No.50 seems to be an option for listed companies for preparing segment reports. This is because TAS No.50 is applied by using the financial analysis notion of assessing enterprise risks and rewards approach for the classification of business and geographic segments. The basis for identifying the predominant source and nature of risks and differing rates of return is also dependent on an enterprise's internal organizational and management structure and its system of internal financial reporting. Information about those segments may already be generated for management's use, so the incremental cost of providing information could be relatively low.

This study finds that some listed companies (approximately 10 percent in 2005) voluntarily disclose segment information based on TAS No.50. Of course, those listed companies do not state explicitly that they adopted TAS No.50 in the notes of financial statements, because no firm wishes to itself, because if the enterprise applies TAS No.50 for financial statements, such an enterprise has to apply the full set of requirements. In particular, auditors face the risk of not knowing how the regulators (i.e. SEC) will respond to disclosures, on which the auditor had rendered an opinion. If the auditor discloses too much information, the client faces a competitive disadvantage. On the contrary, disclosing too little might raise the ire of the regulators.

With the methodology to capture firms which voluntarily apply TAS No.50, the empirical results show that some firms (roughly 4 percent in 2005) utilize either the "management approach", "risk-rewards approach", or "a management approach with

a risks-and-rewards safety net" for preparing segment reporting. Some (around 1 percent) refer to "primary" or "secondary" reports for preparing segment reporting. Moreover, it is interesting to note that some listed companies have just started disclosing segment liabilities since 1999, while the other new disclosures (e.g. cost of acquire property, plant, equipment, and intangibles, depreciation, other non-cash items, and equity method income) required by TAS No.50 are less prevalent and appear temporary before ICAAT issued TAS No.50. Further research might study the motivation of listed companies to voluntarily apply TAS No.50. Otherwise, further research should investigate whether the new requirements have resulted in a greater number of segments and a significant increase in the number of items of information disclosed for each segment.

Furthermore, this study investigates whether or not the information disclosed accurately reflects the business and international operations of the companies concerned. The initial benchmark for assessing the quality (the consistency and compatibility) of disclosures is derived from the supplementary information about the company's activities and organizational structure given in other parts of the company report. This study finds that a problem of identifying separate classes of these activities (i.e. there is the difference in the number of segments and the types of reportable segments) exists. For example, some companies identify segment information based on either lines of business segment or geographical segment, as reflected in the line of "partial consistency (a part of classification)" and "partial consistency (a part of classification but difference in the number of segments)" in Table 5.9, 5.10, and 5.11, although they should describe the activities of each reported industry segment and indicate the composition of each reported geographical area (paragraph 9 and 21 of TAS No.24). Some companies also provide segment information in the notes of financial statements more/less than that founded in the supplementary disclosures in their company reports, as reflected in the line of "consistency (same classification but difference in the number of segments) and "partial consistency (a part of classification but difference in the number of segments) in Table 5.9, 5.10, and 5.11. Finally, some companies have provided segment information in the notes of their financial statements which are not consistent with how they see their activities, based on an assessment of supplementary disclosures in

their company reports, as reflected in the line of “inconsistency” in Table 5.9, 5.10, 5.11, 5.12, 5.13, and 5.14. Hence, the importance of this finding should not be underestimated. Conscious manipulation or inadvertent discrimination in the selection of segments for disclosure purposes can render the financial data provided meaningless. The users of annual reports are possibly confused by the non-disclosure or the disclosure provided, as well as the information found elsewhere in the reports from other companies. For example, a company might have seemingly diverse activities, but no information is given about the segments or the company reveals that it has one operation segment. Thus, confusion and possibly mistrust may be generated. Further research should be directed towards identifying separate classes of business activities and geographical areas by developing more rigid and reliable methodology.

Taken as a whole, most listed companies still have poor segment reporting compliance with the TAS No.24 standard, specifically firms reporting segments by geographical area. A problem in identifying separate classes of business activities and geographical area exists. Regardless, the reasons for poor disclosure compliance and of the problem of identifying segments, and the findings of this study should be of concern to both ICAAT and SEC. Certainly, the findings of segment reporting practices are only the pioneer research leading to further study. For example, further study might consider whether the auditors’ concepts underlying the preparation of segment reports are symptomatically consistent with those of preparers of segment reports. This further study could result in the shortfall practices that would allow additional insight into the problems and find the ways to improve the level of compliance and the level of clearly identifying segments.

The findings of this study raise concern to related parties as follows:

Firstly, the failure of firms to comply with TAS No.24 could be due to the reason that certain requirements of TAS No.24 are ambiguous and that firms need to exercise management discretion when applying the standard. In this respect, the ICAAT drafted the new accounting standard (TAS No.50), which hopefully would improve remove the firm’s potential for ambiguously applying the standards as well as provide a clearer guideline for firms to use in identifying their business segments. However, TAS No.50 is based on the management approach (or risk rewards

approach), which still entails management's judgment when defining segments. This standard is flexible and assumes that management should know the best way to assess risk and the performance of the company. It is adequate to say that the issuance of the TAS No.50 standard could partly help improve the segment disclosure, but may not eliminate all the problems regarding the interpretation and exercising of management's judgment on some issues.

Secondly, the company is subject to compliance with segment reporting. Given that the finest standard is imposed, if the firms perceive that the cost of preparing segment disclosures (e.g. the cost of preparing and providing the segment reports, the cost of losing market share or negotiation advantage, etc.) outweighs its benefits from segment disclosures (which are after all largely intangible), the firms would unlikely report segment information.

Finally, the regulators including standard setters and policy makers need to assess and prioritize what really matters to the Thai business environment. Whether it be the acceptance among world community regarding complying with the international standards, the competitive advantages of businesses in Thailand, or the sake of the financial statement users. The related parties could have the certain direction about segment reporting practices.

7.2 The Quality of Segment Reporting

When accounting information aims to provide investors with the essential inputs for making investment decisions, the information drawn from financial statements is widely used in the capital markets as the means for estimating a firm's security price and forecasting its future performance. Hence, the quality of segment reporting information drawn from the notes of financial statements is defined by the usefulness of the segment information. The higher the quality of segment information, the more useful it is for business decision making. The information should be certainly enhanced by explanatory information provided elsewhere in the financial statements. This study thus investigates two main issues regarding the quality of segment information.

First, the relevance of segmental disclosures on the security price of Thai listed companies is examined by using sample data from 1994-2005. Segment earnings are estimated by regressing security prices on segment earnings. Because of the diversity in practice with the choice of segment earnings, this study uses sales to rank segments. Differences in earnings coefficients across segments provide evidences of the value relevance of segment earnings. The findings of this study reveal that the market uses the segmented earnings to value securities and the disclosure increases the explanatory power of the model. The results imply that just as segment information, a finer source of information, adds more valuable information in addition to aggregated information and helps investors by allowing them to consider the risk and growth potential of each segment, so too the segment data provides incremental information beyond that contained in the firm-level data.

Second, the association between segment information, both sales and earnings, and future performance is examined by regressing future sales (earnings) on segment sales (earnings). The empirical results show that segment information is associated with future performance, but inferior to aggregate information. The latter result is probably due to the absence of external data. In fact, an advantage of disaggregated data is that it allows the user to consider external factors to assess differences in factors according to the sources of the activities. For example, in the case of a business segment, a company's performance can be placed in the context of the performance of specific industries. It enhances the analyst's ability to assess growth. In the case of geographic disclosures, a company's performance can be placed in the context of the performance of economies of specific countries or geographic regions. According to Coller and Pierce (1999), an important factor in the potential usefulness of geographical segment data appears to be due to the enhanced ability of the analyst to assess a difference in at least three risk factors according to the source of the activities: (a) exchange rate risk, (b) political risk, (c) inflation risk. However, these external factors are limited and were not available for this study. In particular, the disclosure of geographical segment is broad and difficult to incorporate in those three factors.

The empirical evidence of testing the usefulness or the quality of segmental disclosures indicates the importance of segment information to the Thai capital

market. The results can also benefit related parties, including the regulators and policy-makers, as well as the listed companies (accounting information preparers) which should promote high quality and reliable segment information. The findings educate investors who are interested in investing their money in the Thai capital market. Further, this study contributes to the body of knowledge by extending disclosure benefits studies to Thailand and the emerging market as well as giving academics some idea for further research.

7.3 Further Research

Segment reporting in practice provides empirical findings that allow information users to recognize how listed companies disclose segment information in the notes of their financial statements and whether such disclosures are consistent with other parts in their annual reports. This study used early empirical evidence that was available regarding the incidence of segmental disclosures or the actual practices of Thai listed companies.

Further research should focus on the problems of compliance with the existing accounting standard to find out the reasons behind the shortfall of practices and of the ways to improve the level of compliance. For example, further research might test a hypothesis relating to the extent of segment reporting of firm-specific characteristics which have an impact on segment reporting. Further research might test the association between the proprietary costs theory and segment disclosures. In general, the proprietary costs include not only the costs of preparing, disseminating and auditing information, but also the cost for deriving information from disclosing information which could be used by competitors and other parties in a way that is harmful for the reporting company.

In addition, further research should be directed towards the means of identifying separate classes of segments and to developing a reliable and useful alternative method of gauging consistency. Further research should also measure the consistency of segment information in segment reporting with other sources provided by an external classification scheme, such as the Standard Industrial Classification scheme in Thailand. This might suggest that the sample companies have identified

their reported business segments with an inter-company or intra-industry comparison, yielding simplicity for assigning companies to specific industry categories and making it easy to test the product market competition-hypotheses.

Finally, the quality of segment reporting also has implications for the usefulness of segment disclosures. Further research should measure the usefulness of segment information with other methodologies, for example, studies of the market reaction to segmental disclosures and the assessment of whether or not knowledge of segment information leads to better investment decisions, etc. Moreover, further research should analyze the external data that represent the industry specific (i.e. the performance of specific industries, the industry competitive index, the risk index of industry) to help assess the performance of a diversified company. The latter studies might use the predictive ability test by comparing the accuracy of forecasts of future sales or earnings based upon consolidated data to that of forecasts based on disaggregated data.

BIBLIOGRAPHY

Ahadiat, Nasrollah. 1993. Geographic Segment Disclosure and the Predictive Ability of the Earnings Data**. Journal of International Business Studies**. 24 (2): 357-371.

Aitken, Michael J.; Czernkowski, Robert M. and Hooper, Cameron G. 1994. The Information Content of Segment Disclosures: Australian Evidence. **ABACUS.** 30 (1): 65-77.

Ajinkya, Bipin B. 1980. An Empirical Evaluation of Line-of-Business Reporting. **Journal of Accounting Research**. 18 (2): 343-361.

Albrecht, David W. and Chipalkatti, Niranjan. 1998. New Segment Reporting. **The CPA Journal**. 68 (May): 46-52.

Alford, Andrew; Jones, Jennifer; Leftwich, Richard and Zmijewski, Mark. 1993. The Relative Informativeness of Accounting Disclosures in Different Countries. **Journal of Accounting Research**. 31 (Supplement): 183-229.

Balakrishnan, Ramji; Harris, Trevor S. and Sen, Pradyot K. 1990. The Predictive Ability of Geographic Segment Disclosures. **Journal of Accounting Research**. 28 (2): 305-325.

Baldwin, Bruce A. 1984. Segment Earnings Disclosure and the Ability of Security Analysts to Forecast Earnings per Share. **The Accounting Review.** 59 (July): 376-389.

Ball, Ray and Brown, Philip. 1968. An Empirical Evaluation of Accounting Income Numbers. **Journal of Accounting Research**. 6 (Autumn): 159-178.

Barefield, Russell M. and Comiskey, Eugene E. 1975. Segmental Financial Disclosure by Diversified Firms and Security Prices: A Comment. **The Accounting Review**. 50 (October): 818-821.

Barth, Mary E. 2000. Valuation-Based Accounting Research: implications for Financial Reporting and opportunities for Future research. **Accounting and Finance.** 40 (1): 7-31.

Barth, Mary E.; Beaver, William H. and Landsman, Wayne R. 2001. The Relevance of the Value Relevance Literature for Financial Accounting Standard Setting: Another View. **Journal of Accounting and Economics.** 31 (September): 77-104.

Beaver, William H. 1968. The Information Content of Annual Earnings Announcement. **Journal of Accounting Research**. 6 (Supplement): 67-92.

Beaver, William H. 1998. **Financial Reporting: An Accounting Revolution**. 3rd ed. Englewood Cliffs, N.J.: Prentice-Hall.

Beaver, William H. 2002. Perspective on Recent Capital Market Research. **The Accounting Review**. 77 (April): 453-474.

Behn, Bruce K.; Nichols, Nancy B. and Street, Donna L. 2002. The Predictive Ability of Geographic Segment Disclosures by U.S. Companies: SFAS No.131 vs. SFAS No.14. **Journal of International Accounting Research.** 1: 31-44.

Bernard, Vector L. and Stober, Thomas L. 1989. The Nature and Amount of Information in Cash Flows and Accruals. **The Accounting Review.** 64 (October): 624-652.

Biddle, Gary C.; Seow, Gim S. and Siegel, Andrew F. 1995. Relative versus Incremental Information Content. **Contemporary Accounting Research**. 12 (1): 1-23.

Boatsman, James R.; Behn, Bruce R. and Patz, Dennis H. 1993. A Test of the Use of Geographical Segment Disclosures. **Journal of Accounting Research**. 31 (Supplement): 46-64.

Bowen, Robert M.; Burgstahler, David and Daley, Lane A. 1986. Evidence on the Relationships between Earnings and Various Measures of Cash Flow. **The Accounting Review**. 61 (October): 713-725.

Bunce, Kenneth R. 1999. It's Time to Implement Segment Disclosures. **Journal of Accountancy**. 187 (January): 43-45.

Coller, Maribeth and Pierce, Barbara G. 1999. The New Segment Information: Is it Any Better? **Journal of Financial Statement Analysis**. 4 (2): 65-72.

Collins, Daniel W. 1976. Predicting Earnings with Sub-Entity Data: Some Further Evidence. **Journal of Accounting Research**. 14 (Spring): 163-177.

Collins, Daniel W.; Maydew, Edward L. and Weiss, Ira S. 1997. Changes in the Value Relevance of Earnings and Book Values over the Past Forty Years. **Journal of Accounting and Economics**. 24 (December): 36-67.

Collins, Daniel W. and Simonds, Richard R. 1979. SEC Line-of-Business Disclosure and Market Risk Adjustments. **Journal of Accounting Research**. 17 (2): 352-383.

Core, John E.; Guay, Wayne R. and Buskirk, Andrew V. 2003. Market Valuations in the New Economy: An Investigation of What Has Changed. **Journal of Accounting and Economics**. 34 (January): 43-67.

Deppe, Larry and Omer, S.C. 2000. Disclosing Disaggregated Information**. Journal of Accountancy**. 190 (September): 47-54.

Dielman, Terry E. 2005. **Applied Regression Analysis: A Second Course in Business and Economic Statistics**. 4th ed. Belmont, CA: Brooks/Cole Thomson Learning.

Easton, Peter D. and Harris, Trevor S. 1991. Earnings as an Explanatory Variable for Returns. **Journal of Accounting Research**. 29 (1): 19-36.

Ely, Kirsten and Waymire, Gregory. 1999. Accounting Standard-Setting Organizations and Earnings Relevance: Longitudinal Evidence from NYSE Common Stocks, 1927-93. **Journal of Accounting Research.** 37 (2): 293-317.

Emmanuel, C.R. and Gorrod, N. 1987. On the Segment Identification Issue. **Accounting and Business Research.** 17 (67): 235-240.

Emmanuel, C.R. and Gray, S.J. 1977. Segmental Disclosures and the Segment Identification Problem. **Accounting and Business Research.** 2 (Winter): 37-50.

Emmanuel, C.R. and Pick, R.H. 1980. The Predictive Ability of UK Segment Reports. **Journal of Business Finance and Accounting**. 7 (2): 201-218.

Ettredge, Michael L; Kwon, Soo Y.; Smith, David B. and Zarowin, Paul A. 2005. The Impact of SFAS No.131 Business Segment Data on the Market's Ability to Anticipate Future Earnings. **The Accounting Review.** 80 (3): 773-804.

Feltham, Gerald A. and Ohlson, James A. 1995. Valuation and Clean Surplus Accounting for Operating and Financial Activities. **Contemporary Accounting Research**. 11 (2): 689-731.

Finger, Catherine A. 1994. The Ability of Earnings to Predict Future Earnings and Cash Flow. **Journal of Accounting Research.** 32 (2): 210-223.

Foster, George. 1986. **Financial Statement Analysis**. 2nd ed. London: Prentice-Hall.

Francis, Jennifer and Schipper, Katerine. 1999. Have Financial Statements Lost their Relevance? **Journal of Accounting Research.** 37 (2): 319-352.

Givoly, Dan; Hayn, Carla and D'Souza, Julia. 1999. Measurement Errors and Information Content of Segment Reporting. **Review of Accounting Studies**. 4 (1): 15-43.

Graham, Roger; King, Raymond and Bailes, Jack. 2000. The Value Relevance of Accounting Information during a Financial Crisis: Thailand and the 1997 Decline in the Value of the Baht. **Journal of International Financial Management and Accounting**. 11 (2): 84-107.

Gray, S. J. 1978. Segment Reporting and the EEC Multinationals**. Journal of Accounting Research.** 16 (2): 242-253.

Gray, S.J. and Radebaugh, Lee H. 1984. International Segment Dislcosures by U.S. and U.K. Multinational Enterprises: A Descriptive Study. **Journal of Accounting Research**. 22 (1): 351-360.

Gujarati, Damodar. N. 2003. **Basic Econometrics**. 4th ed. Boston, Mass.: McGraw-Hill.

Haller, Axel. 2003. Segmental Reporting. In **International Accounting**. Peter Walton, Axel Haller and Bernard Raffournier, eds. 2nd ed. London: Thomson Learning. Pp. 444-470.

Healy, Paul M. and Palepu, Krishna G. 1993. The Effect of Firms' Financial Disclosure Strategies on Stock Prices. **Accounting Horizons**. 7 (1): 1-11.

Healy, Paul M. and Palepu, Krishna G. 2001. Information Asymmetry, Corporate Disclosure, and The Capital Markets: A Review of the Empirical Disclosure Literature. **Journal of Accounting and Economics**. 31 (September): 405-440.

Hermann, Don and Thomas, Wayne B. 1997. Geographic Segment Disclosures: Theories, Findings, and Implications. **The International Journal of Accounting**. 32 (4): 487-501.

Hermann, Don and Thomas, Wayne B. 2000. An Analysis of Segment Disclosures under SFAS No.131 and SFAS No.14. **Accounting Horizons.** 14 (3): 287-302.

Holthausen, Robert W. and Watts, Ross L. 2001. The Relevance of the Value-relevance Literature for Financial Accounting Standard Setting. **Journal of Accounting and Economics**. 31 (September): 3-75.

Horwitz, Bertrand and Kolodny, Richard. 1977. Lines of Business Reporting and Security Prices: An Analysis of an SEC Disclosure Rule. **The Bell Journal of Economics**. 8 (Spring): 234-249.

Imhoff, E., Jr. 1992. The Relation between Perceived Accounting Quality and Economic Characteristics of the Firm. **Journal of Accounting and Public Policy**. 11 (2): 97-118.

The Institute of Certified Accountants and Auditors of Thailand. 1996. **Accounting Standard No. 1-29.** Bangkok: The Institute of Certified Accountants and Auditors of Thailand. (In Thai)

The Institute of Certified Accountants and Auditors of Thailand. 2001. **Accounting Standard No. 50: Segment Reporting.** Bangkok: The Institute of Certified Accountants and Auditors of Thailand. (In Thai)

The International Accounting Standard Board. 2001. **International Accounting Standard.** London: The International Accounting Standard Board.

Jenkins, David S.; Kane, Gregory D. and Velury, Uma. 2004. The Impact of the Corporate Life-Cycle on the Value-Relevance of Disaggregated Earnings Components. **Review of Accounting and Finance**. 3 (4): 5-20.

Kanogporn Narktabtee. 2000. **The Implication of Accounting Information in the Thai Capital Market**. Doctoral dissertation, University of Arkansas.

Kinney, William R., Jr. 1971. Predicting Earnings: Entity Versus Subentity Data. **Journal of Accounting Research.** 9 (Spring): 127-136.

Kochanek, Richard F. 1974. Segmental Financial Disclosure by Diversified Firms and Security Prices. **The Accounting Review**. 50 (April): 245-258.

Kothari, S.P. and Zimmerman, Jerold L. 1995. Price and Return Models. **Journal of Accounting and Economics**. 20 (September): 155-192.

Kutner, Michael H.; Nachtsheim, Christopher J.; Neter, John and Li, William. 2005. **Applied Linear Statistical Models**. 5th ed. New York: McGraw-Hill/Irwin.

Lev, Baruch. 1989. On the Usefulness of Earnings and Earnings Research: Lessons and Directions from Two Decades of Empirical Research. **Journal of Accounting Research**. 27 (Supplement): 153-201.

Lev, Baruch. and Zarowin, Paul. 1999. The Boundaries of Financial Reporting and How to Extend Them. **Journal of Accounting Research**. 37 (2):353-385.

Lobo, Gerald J.; Kwon, Sung S. and Ndubizu, Gordian A. 1998. The Impact of SFAS No.14 Segment Information on Price Variability and Earnings Forecast Accuracy. **Journal of Business Finance & Accounting**. 25 (7)&(8): 969-985.

Lundholm, Russell J. 1995. A Tutorial on the Ohlson and Feltham/Ohlson Models: Answers to Some Frequently Asked Questions. **Contemporary Accounting Research**. 11 (2): 749-761.

McConnell, Patricia and Pacter, Paul. 1995. IASC and FASB Proposals Would Enhance Segment Reporting. **The CPA Journal**. 65 (August): 32-51.

Maddala, G.S. 1992. **Introduction to Econometrics**. 2nd ed. New York: Macmillan.

Marschak, Jacob and Radner, Roy. 1972. **Economic Theory of Teams**. New Haven: Yale University Press.

Ministry of Commerce. 1999. **Flowchart of Thai Accounting Standards No. 1-48 and the Framework (Summary).** 3rd ed. Bangkok: Ministry of Commerce.(In Thai)

Mohr, Rosanne M. 1983. The Segmental Reporting Issue: A Review of Empirical Research. **Journal of Accounting Literature**. 2 (Spring): 39-71.

Negakis, Christos J. 2005. Accounting and Capital Markets Research: A Review**.** **Managerial Finance**. 31 (2): 1-23.

Newey, Whitney K. and West, Kenneth D. 1987. A Simple, Positive Semi-definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix. **Econometrica.** 55 (3): 703-708.

Nichols, D.C. and Wahlen, James M. 2004. How do Earnings Numbers Relate to Stock Returns? A Review of Classic Accounting Research with Updated Evidence. **Accounting Horizons.** 18 (4): 265-267.

Nichols, Dave; Tunnell, Larry and Waldrup, Bob. 1996. An Exploratory Study of the Effect on Forecast Accuracy of Using Different Geographic Segment Data Sources. **Journal of International Financial Management and Accounting**. 7 (2):125-136.

Nichols, Nancy B. and Street, Donna L. 1999. Segment Information: What Early Adopters Reported. **Journal of Accountancy**. 187 (January): 37-41.

Nichols, Nancy B.; Street, Donna L. and Gray, Sidney J. 2000. Geographic Segment Disclosures in the United States: Reporting Practices Enter A New Era. **Journal of International Accounting, Auditing & Taxation**. 9 (1): 59-82.

Ohlson, James A. 1995. Earnings, Book Values, and Dividends in Equity Valuation. **Contemporary Accounting Research**. 11 (2):661-687.

Pimpana Srisawadi. 1996. **The Relationship between Stock Returns and Earnings Information in Thailand**. Doctoral dissertation, Boston University.

Prather-Kinsey, Jenice and Meek, Gary K. 2004. The Effect of Revised IAS 14 on Segment Reporting by IAS Companies. **European Accounting Review**. 13 (2): 213-234.

Prodhan, Bimal K. 1986. **Multinational Accounting: Segment Disclosure and Risk**. Dover, N.H.: Croom Helm.

Prodhan, Bimal K. and Harris, Malcolm C. 1989. Systematic Risk and the Discretionary Disclosure of Geographical Segments: An Empirical Investigation of US Multinationals. **Journal of Finance & Accounting**. 16 (4): 467-492.

Punya Sumritpradit. 2002. **A Study of Factors Influencing Value-Relevance of Earnings and Book Value in the Stock Exchange of Thailand**. Doctoral dissertation, Chulalongkorn University. (In Thai)

Rahman, M. Z. 1998. **The Role of Accounting Disclosure in the East Asian Financial Crisis: Lessons Learned?** A Report Submitted to the United Nations Conference on Trade and Development, December.

Rayburn, Judy. 1986. The Association of Operating Cash Flow and Accruals with Security Returns. **Journal of Accounting Research**. 24 (Supplement): 112-133.

Rennie, Elaine D. and Emmanuel, Clive R. 1992. Segment Disclosure Practice: Thirteen Years On. **Accounting and Business Research**. 22 (Spring):151-159.

Riahi-Belkaoui, Ahmed. 2000. **Accounting Theory**. 4th ed. London: Thomson Learning.

Roberts, Clare B. 1989. Forecasting Earnings Using Geographical Segment Data: Some UK Evidence. **Journal of International Financial Management and Accounting**. 1 (2): 130-151.

Scott, William. R. 1997. **Financial Accounting Theory**. Upper Saddle River, N.J.: Prentice-Hall.

Silhan, Peter A. 1982. Simulated Mergers of Existent Autonomous Firms: A New Approach to Segmentation Research. **Journal of Accounting Research**. 20 (1): 255-262.

Sillapaporn Srijunpetch. 2004. **The Implementation of International Accounting Standards in Thailand**. Doctoral dissertation, The University of Manchester.

Stewart, Kenneth.G. 2005. **Introduction to Applied Econometrics**. Belmont, CA.: Brooks/Cole Thomson Learning.

Street, Donna L. and Nichols, Nancy B. 2002. LOB and Geographic Segment Disclosures: An Analysis of the Impact of IAS 14 Revised. **Journal of International Accounting, Auditing & Taxation.** 11 (2): 91-113.

Street, Donna L.; Nichols, Nancy B. and Gray, Sidney J. 2000. Segment Disclosures under SFAS No.131: Has Business Segment Reporting Improved. **Accounting Horizons**. 14 (3): 259-285.

The Stock Exchange of Thailand. 1993. **Fact Book 1993.** Bangkok: The Stock Exchange of Thailand, Research & Development Department.

The Stock Exchange of Thailand. 1994. **Fact Book 1994.** Bangkok: The Stock Exchange of Thailand, Research & Development Department.

The Stock Exchange of Thailand. 1995. **Fact Book 1995.** Bangkok: The Stock Exchange of Thailand, Research & Development Department.

The Stock Exchange of Thailand. 1996. **Fact Book 1996.** Bangkok: The Stock Exchange of Thailand, Research & Development Department.

The Stock Exchange of Thailand. 1997. **Fact Book 1997.** Bangkok: The Stock Exchange of Thailand, Research & Development Department.

The Stock Exchange of Thailand. 1998. **Fact Book 1998.** Bangkok: The Stock Exchange of Thailand, Research & Development Department.

The Stock Exchange of Thailand. 1999. **Fact Book 1999.** Bangkok: The Stock Exchange of Thailand, Research & Development Department.

The Stock Exchange of Thailand. 2000. **Fact Book 2000.** Bangkok: The Stock Exchange of Thailand, Research & Development Department.

The Stock Exchange of Thailand. 2001. **Fact Book 2001.** Bangkok: The Stock Exchange of Thailand, Corporate Communications Department, Publication Units.

The Stock Exchange of Thailand. 2002. **Fact Book 2002.** Bangkok: The Stock Exchange of Thailand, Corporate Communications Department, Publication Units.

The Stock Exchange of Thailand. 2003. **Fact Book 2003.** Bangkok: The Stock Exchange of Thailand, Publication Department.

The Stock Exchange of Thailand. 2004. **Fact Book 2004.** Bangkok: The Stock Exchange of Thailand, Publication Department.

The Stock Exchange of Thailand. 2005. **Fact Book 2005.** Bangkok: The Stock Exchange of Thailand, Publication Department.

The Stock Exchange of Thailand. 2006. **Fact Book 2006.** Bangkok: The Stock Exchange of Thailand, Publication Department.

Stowe, John D.; Robinson, Thomas R.; Pinto, Jerald E. and McLeavey, Denis W. 2002. **Analysis of Equity Investments: Valuation**. Bapimore, M.D.: United Book Press.

Suchitra Vacharajittipan. 1991. **The Information Content of Quarterly Earnings: The Case of Thailand.** Doctoral dissertation, The George Washington University.

Swaminathan, Siva. 1991. The Impact of SEC Mandated Segment Data on Price Variability and Divergence of Beliefs. **The Accounting Review.** 66 (1): 23-41.

Swaminathan, Siva and Weintrop, Joseph. 1991. The Information Content of Earnings, Revenues, and Expenses. **Journal of Accounting Research**. 29 (2): 418-427.

Thomas, Wayne B. 2000. The Value Relevance of Geographic Segment Earnings Disclosures under SFAS 14. **Journal of International Financial Management and Accounting**. 11 (3): 133-155.

White, Gerald I.; Sondhi, Ashwinpaul C. and Fried, Dov. 2003. **The Analysis and Use of Financial Statements**. 3rd ed. Hoboken, N.J.: Wiley.

White, Halbert. 1980. A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. **Econometrica**. 48 (4): 817-837.

Wilson, G. P. 1987. The Incremental Information Content of the Accrual and Funds Components of Earnings after Controlling for Earnings. **The Accounting Review**. 62 (April): 293-322.

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