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Department of Accountancy
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**An Empirical Study of the Characteristics of Hong Kong
Listed Companies that Practised Discretionary Segmental
Disclosure**

A thesis in partial fulfillment of the requirements for the Degree of MPhil in Accountancy

by

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Abstract

Research on segment disclosure has been conducted mainly with U.S. data, using American corporations or multi-national corporations as objects of investigation. Voluntary segmental disclosure is basically a management decision, which has its cultural biases. What is generally considered as usual disclosure practice in the developed, advanced economies like the U.S., U.K., or Europe may not find equal acceptance in other non-western economic systems. In my thesis, I examine segmental disclosure practices of listed firms in the Hong Kong market.

With the pronouncement of **SSAP 26 Segment Reporting**, the Hong Kong Society of Accountants (HKSA) is determined to harmonize its regulatory requirements on segment reporting with international accounting standards. Except for some geographical terms, **SSAP 26** is almost identical to **IAS No.14 'Segment Reporting'** issued by the International Accounting Standards Committee (IASC).

This study examines the characteristics of Hong Kong listed companies regarding their voluntary segment disclosure practices before the official commencement of **SSAP 26**. Like extant research findings, I find that firm size in terms of total assets, its leverage in terms of debt/equity ratio, the number of industries it operates in, and analysts' forecast errors of the firm's earnings from the previous year are all positively related to the number of segments voluntarily disclosed in the current year. However, the current year number of analysts following the firm and the percentage of block share holding by

institutional investors are negatively related to the number of disclosed segments of that year.

I also find that the difference of a Hong Kong firm's monthly average stock return over its industrial norm is positively related to the firm's market capitalized value and the additional institutional interest in the firm. However, the average monthly stock return differential is also found to be negatively associated with the number of analysts contemporarily following the firm and the percentage of block share holding owned by the institutional investors. The two negative relationships are contrary to the conventional expectations based on the studies using mainly U.S. firms' data. One possible conclusion is that Hong Kong firms are culturally different. Consistent with the findings of other researchers using Hong Kong data, I find that firms in Hong Kong tend to be secretive.

My study contributes evidence to Gray's theory (Gray 1988) that the influence of culture on accounting is important in understanding cross-country differences. My findings help shed light on the notion that accounting is culturally driven, despite the well-intended global accounting standard harmonization movement.

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CHAPTER 1. Motivation of the Study

Segment reporting and segment disclosure have been a popular topic in accounting research since the 1970s. Most of the studies in this area are based on U.S. data, using American corporations or multi-national corporations (MNC) as objects of investigation. For the most part, the studies examine the level of disclosure, and the practice and extent of segment reporting. The rationale behind voluntary disclosure relating to segment reporting, etc. have been studied at great length. Overall, the studies conclude that segmental reporting is valuable as there is a positive share market response and a reduction in the cost of capital. Many models and theories have been built on empirical data drawn from the U.S., U.K., and European companies. They have enriched our understanding of firms' behaviour in the area of information disclosure. However, the evidence on the importance of segmental disclosure for Asian and Hong Kong companies is sparse.

The existing empirical and theoretical literature has tended to look at voluntary disclosure as a generic issue, whereas other field research shows that there are clear differences across types of information and across countries (**Meek, Roberts, and Gray 1995**). Voluntary segmental disclosure—disclosure exceeding the statutory requirements on segment reporting—is basically a management decision, inseparable from the culture that exists inside the firm. This in turn is influenced by the culture outside the firm as well as the external demand and influences for this information. What is generally considered as normal and desirable accounting practice in advanced economies like the U.S., U.K., or Europe may not be necessarily translated to managers in other economies, e.g. Hong Kong and Singapore. In these countries, the occupants are mainly Chinese but are under a very Westernized cultural

influence. Such cultural influence, particularly in how to run a business, may lead to a manager's decisions and practices being vastly different from his/her Western counterparts.

The cultural difference is echoed by **Hofstede** (1993), who classifies those Chinese living outside mainland China—in Taiwan, Hong Kong, and Singapore—as the Overseas Chinese who are distinct from those inside the mainland. The Overseas Chinese have been very successful in these 3 economies, and they also play a pivotal role in other South East Asian economies such as Indonesia, Malaysia, the Philippines, and Thailand. Collectively, the Overseas Chinese enterprises command an estimated Gross National Product (GNP) of 200 to 300 billion US dollars, which is bigger than that of Australia. **Hofstede** notices that these Overseas Chinese enterprises share a common characteristic: they tend to be small, family-owned, and without the typical separation between ownership and management found in the West, or even in South Korea and Japan.

In addition, **Hofstede** describes that these distinctive Overseas Chinese:

“...prefer economic activities in which great gains can be made with little manpower, like commodity trading and real estate. They employ few professional managers, except their sons and sometimes daughters who have been sent to prestigious business schools abroad, but who upon return continue to run the family business the Chinese way.” (**Hofstede** 1993).

Adopting **Hofstede's** (1984) paradigm on 4 cultural dimensions, **Gray** (1988) develops a model of accounting values that explains and determines the structure and practice of accounting, including measurement and disclosure that determine financial reporting

practices. Gray identifies 4 accounting values: *Professionalism* (versus Statutory Control), *Uniformity* (versus Flexibility), *Conservatism* (versus Optimism), and *Secrecy* (versus Transparency). These accounting values, operating in various cultural contexts and capital markets, will arrive at a distinct set of accounting systems comprising financial reporting practices and professional structure.

Gray (1988) comments that the influence of culture on accounting seems to have been largely neglected. He suggests that culture shapes a manager's preference for confidentiality and the restricted information disclosure about the business. Cultural differences in managers can explain why a firm prefers to disclose information only to those who are closely involved with its management and financing. Such secrecy is closely linked with the *uncertainty avoidance* and *individualism* dimensions of a firm's culture. This relationship is affirmed by **Salter and Niswander (1995)**.

It is against this backdrop that I carry out a research study on the segmental disclosure practices of firms in Hong Kong. Specifically, my research questions (RQs) are related to three main areas:

- RQ1 – How many segments does a listed firm in Hong Kong disclose and has the degree of segmental disclosure changed over time?
- RQ2 - What are the factors that explain the difference in segmental disclosure for listed companies in Hong Kong? Are the factors the same as prescribed by accounting researchers in other advanced economies?
- RQ3 - Will voluntary segmental disclosure be rewarded by the capital market? The Hong Kong business environment is characterised as an open one with little

entry- or exit-barriers either in terms of goods or capital flows. Thus the benefits to segmental information are likely to be substantial. An important aspect here is whether the benefits of segmental information through the adverse selection motive (Lang and Lundholm 1993) and inducing more analyst following (Healy, Hutton, and Palepu 1999) are paramount; or whether proprietary costs (Hayes and Lundholm 1996; Harris 1998) are a more important concern for the managers in Hong Kong firms. The answer to this question is to be found in the value that the market attributes to the segmental disclosure.

The study proceeds as follows: first, a background for the development of segmental disclosure requirements is presented in Chapter Two. This describes the recent changes stipulated by the International Accounting Standards Committee (IASC), the Financial Accounting Standards Board (FASB) in the U.S., and the Hong Kong Society of Accountants (HKSA). Chapter Three covers the literature review on segment reporting. Sample selection and descriptive statistics of the segmental disclosure are described in Chapter Four. The measurements of segmental disclosure level, independent variables and hypotheses development are presented in Chapter Five. Chapter Six reports the statistical results based on one the derived measurement SumSeg. Chapter Seven contains test results of the variables based on an alternatively derived measurement TMDS. Chapter Eight explores the relationship between segmental disclosure and capital market. Finally, the discussion and conclusion are given in Chapter Nine

This study contributes to the robustness of segmental disclosure theories. It provides empirical evidence on the motivation for, and the benefits of, disclosure on firms operating in Hong Kong and that have a different emphasis on information disclosure to that of their Western counterparts. Many Hong Kong managers have been trained in westernized business schools and yet their workplace is embedded with many deep-rooted, oriental,

conservative norms and cultures. Their resultant behaviour, as expressed in the decisions over the dilemma for improved transparency versus increased secrecy, should be of interest to accounting standard setters. Similarly, it is of interest in that the Hong Kong capital market may or may not reward the voluntary disclosure of segment information to the same degree as that of Western markets.

CHAPTER 2: Background of Segmental Reporting Requirements

In February 2000, the Hong Kong Society of Accountants (HKSA) issued a Statement of Standard Accounting Practice #2.126 (alias **SSAP 26**), stipulating that Society members comply with the standard in respect of financial statements relating to periods beginning on or after 1st January, 2001. The new SSAP follows closely the International Accounting Standard 14 (**IAS No.14**) issued by the International Accounting Standards Committee (IASC). Also, the HKSA makes it clear that compliance with this Statement (i.e. **SSAP 26**) ensures compliance with International Accounting Standard **IAS No.14** "Segment Reporting" (*para 85, Compliance with International Accounting Standard, SSAP 2.126*).

2.1 Segmental Reporting: The International Requirements

What **IAS No. 14(revised)** recommends is a response to the needs for a more meaningful disclosure of a company's business by segments. The original **IAS No.14** was issued in 1981 but was revised in 1998, following the perceived need to improve the level and quality of segmental reporting. The original standard was considered too general in its requirements to be effective and had been under review since 1994. As a result in January 1997, the IASC approved revisions that came into force for all companies with accounting periods beginning on or after 1st July 1998. The **IAS No. 14(revised)**, *Reporting Financial Information by Segment*, was considered to represent a tightening of the original requirements of **IAS No. 14**.

The key development embedded in **IAS No. 14(revised)** is that an enterprise's internal organizational and management structure, and its system of internal financial reporting to the Board of Directors and CEO, should be the normal basis for classifying the predominant segments for the enterprise's business risks and returns. **IAS No. 14(revised)** reaffirms that

public companies must report information along product (and services) and along geographical lines. There are two bases for segmentation: one is *primary*, the other is *secondary*. For each *primary* segment, segment disclosures should include:

- (i) revenue before interest and taxes (external and inter-segment shown separately);
- (ii) carrying amount of segment assets;
- (iii) cost to acquire property, plant, equipment, and intangibles;
- (iv) the basis of inter-segment pricing;
- (v) carrying amount of segment liabilities;
- (vi) depreciation and amortisation;
- (vii) non-cash expenses other than depreciation;
- (viii) share of profit or loss of equity and joint venture investments.

As for segment disclosures for the *secondary* basis, only parts (i) to (iv) are required.

The new standard upholds the 10% materiality thresholds in segment reporting and it stipulates that segments must equal at least 75% of consolidated revenue. In short, it 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.

In fact, the IASC revised its IAS No. 14 at a time very close to that when the U.S. Financial Accounting Standards Board (FASB) was revising its similar statement on Segment Reporting.

2.2 Segment Reporting in the U.S.

In 1970, the U.S. Securities and Exchange Commission (SEC) required that line-of-business revenue and income information be reported by the U.S. listed companies in their Form 10-K filings for those business segments contributing more than ten percent of consolidated revenues or income. These disclosure requirements were later extended to their annual reports.

In December 1976, the Financial Accounting Standards Board (FASB) issued its Statement of Financial Accounting Standard No. 14 (SFAS No. 14), *Financial Reporting for Segments of a Business Enterprise (1976)*. This standard required firms to disclose segment assets, depreciation, capital expenditures, and effects of accounting changes on segment income on top of the disclosure requirements of the SEC. It also set down the definition of 'reportable segment' as one that comprised at least ten percent of consolidated assets, revenue, profit or loss. The maximum number of reportable segments was limited to ten (due to the 10% materiality rule), but the combined revenue from sales to unaffiliated customers of all reportable segments had to reach at least 75% of consolidated revenue.

However, the criteria for segment definition were considered too flexible. The usefulness of these reportable segments was far from satisfactory. Though firms were required to disclose segment information by both line-of-business and geographic area under SFAS No.14, many information users complained that the resulting disclosures were highly aggregated. The information had no specific link to the internal organization of the company, and that the

segment definition guidelines had been exploited by companies to suit their own financial-reporting purposes (AIMR 1993).

Following the outcry in the investment sector to re-examine segment reporting requirements, the American Institute of Certified Public Accountants (AICPA) formed a Special Committee on Financial Reporting in 1991. Its main mission was to recommend the type and extent of information that a firm's managers should make available to other stakeholders. After several years of research, the Committee concurred that the criteria set forth in SFAS No. 14 for identifying reportable segments were too vague and general:

“... The notion of an ‘industry segment’ lacks precision. Surveys of user groups cited in the FASB and Canadian Institute of Chartered Accountants (CICA) research studies on segment reporting suggest that firms have exploited this flexibility and imprecision to conceal from statement users important operating information by defining reportable segments too broadly.”

--Response to the FASB Discussion Memorandum “Reporting Disaggregated Information by Business Enterprises”, American Accounting Association’s Financial Accounting Standards Committee, 1994.

The committee concluded that surveys of and interviews with user groups’ representatives had clearly indicated that users place a high value on segment reporting. It recommended that investors be provided with a number of additional disclosures, including more segment details and supplemental non-financial forward-looking information, to improve both the quality and quantity of segment information.

Following the recommendations, FASB amended and replaced SFAS No. 14 with a new SFAS No. 131, *Disclosure About Segments of an Enterprise and Related Information* in July

1997. As of December 15, 1997, **SFAS No. 131** took effect and replaced the former **SFAS No. 14**.

The new Statement requires a firm to disclose its operating segments' results not by geographical boundaries, or by industrial classification, or by major customers' approach but on the firm's internal classification according to the firm's managerial structure. It establishes requirements that a firm has to disclose reportable segments based on how a company is managed, i.e. from the management approach. The company is required to make limited interim disclosures. Moreover, under **SFAS No. 131**, all companies must provide **enterprise-wide disclosures** such as data about products, geographic locations, and major customers even though there is only one reportable operating segment. In making geographic disclosures, companies are required to disclose separate country of domicile information under the new Statement.

Firms with more than one reportable segment (business or geographical) are required to disclose more details. Such details include some general information (such as the criteria for segmentation, whether the firm aggregated its segments, and the types of products and services from which a reportable segment derives its revenue). More importantly for each segment, segment profit (or loss), segment assets, information on measurement and reconciliation, depreciation and amortization expense, and capital expenditures for each segment need to be disclosed.

With such comprehensive disclosure requirements, it seems natural to expect a more enhanced predictive ability of future earnings from the use of such segment disclosures by means of a management perspective than by the consolidated earnings approach. In other

words, the new segment reporting requirements under the management approach should improve the accuracy of earnings predictions.

2.3 Segment Reporting in Hong Kong

Prior to 1986, there were no explicit accounting standards or requirements set on the segmental information by the public firms in Hong Kong (although the original IAS No. 14 had been in operation since 1981). On 1 February 1986, the Securities (Stock Exchange Listing) Rules 1986 came into effect. These rules required disclosure of certain segmented information in the annual report presented at a general meeting held on, or after, 1 July 1986. In response to such listing rules, the Hong Kong Society of Accountants (HKSA) issued a guidance statement 2.206 (also called Accounting Guideline AG6) in June 1986. The HKSA stipulated that the guideline was to apply “to all companies whose securities are listed on the Unified Stock Exchange in Hong Kong” (*Part 1, para. 2, AG6*).

Generally speaking, an Accounting Guideline is considered “highly recommended” but not “mandatory” for the members of the HKSA to follow. It is less compelling than a Statement of Standard Accounting Practice (such as the SSAP 26). Accordingly, any disclosure about the segments under the regime of an Accounting Guideline can be regarded as voluntary, although there are powerful incentives to disclose.

The HKSA recognized that profitability rates, growth opportunities, future prospects, and investment risks may vary greatly among principal activities and geographical areas. Users of financial statements need segmented information to assess the prospects and risks of a

diversified company. This information is not determinable from the consolidated, aggregated data. The HKSA agreed with the view that:

“...the objective of presenting information by *segments* is to provide users of financial statements with information on the relative size, profit contribution and growth trend of the different activities and different geographical areas in which a diversified company operates to enable them to make more informed judgements about the company as a whole.” (*Part 1, para. 5, AG6*)

However, reporting segmented information involves management decisions that are partly based on judgement. Managers have to decide what to include in the segment disclosures: how to identify the activities and how to allocate turnover and expenses to those activities. In this regard, the HKSA stipulated that a *segment* could be either a geographical area, or a principal activity (*Part 2, para. 10, AG6*). It also recommended to its members that, if a company had carried on business in two or more principal activities, the company should disclose the financial information in its annual report in the form of:

- a. a description of each principal activity; and
- b. the consolidated turnover and contribution to trading results of each principal activity. (*Part 3, para. 15, AG6*)

The identification of a geographical area was quite specific:

“...Geographical analysis is sometimes presented on the basis of the location of operations of the company, sometimes on the basis of markets and sometimes on

both. A company's domestic operations are normally considered to be a separate geographical area." (*Part 3, para. 19, AG6*)

In comparison, the identification of an activity was given a much wider flexibility:

"... It is the responsibility of management to exercise its judgement in determining how the company's activities are to be grouped for reporting as segments. In making such decisions, management would normally take account of many factors. Such factors include similarities and differences in the company's products and operations and in the operating and marketing areas as well as the relative importance of those areas within the company as a whole." (*Part 3, para. 20, AG6*)

But to what extent should a company disclose its operations in segments, either in terms of activities or geographical areas? The HKSA did not specify. It only echoed the view of adopting the 10 per cent threshold for segment identification stated in the Securities (Stock Exchange Listing) Rules 1986, para. 4 (1)(a) and (b) as:

"Where a company has operations overseas which comprise more than 10 per cent of turnover or contribute more than 10 per cent of the trading results, it should include an analysis of the turnover and contribution to trading results by geographical areas in its annual report." (*Part 3, para. 16, AG6*)

However, given such flexibility in the classification of segments, managers were not obliged to follow exactly what the Accounting Statement had intended. They defined their product lines or markets broadly, by combining operations to obscure each individual line of business performance, or by varying the classification over time. When the consistency over time in

segments classification is lacking, the informativeness of segment disclosures to the information users in assessing the risks and returns of an enterprise suffers and is of limited use for the users' decision-making purposes.

Almost two years after the **IAS No. 14 (revised)** had come into being, the HKSA issued an Exposure Draft "Statement of Standard Accounting Practice – Segment Reporting" in February 1999. The Exposure Draft was modeled on **IAS No. 14 (Revised)** and the HKSA requested its members to present their comments before 31 May 1999. In February 2000, the Exposure Draft was formalized into a Statement of Standard Accounting Practice **SSAP 2.126 Segment Reporting** which states that:

"The practices set out in this Statement should be regarded as standard in respect of financial statements relating to periods beginning on or after **1 January, 2001**. Earlier application is encouraged but not required. If financial statements include comparative information for periods prior to the effective date or earlier voluntary adoption of this Statement, restatement of segment data included therein to conform to the provisions of this Statement is required unless it is not practicable to do so, in which case the enterprise should disclose that fact." (*para 84, Effective Date, SSAP 2.126*)

Also, in an effort to harmonize with international accounting standards, the HKSA makes it clear that:

"Compliance with this Statement ensures compliance with International Accounting Standard **IAS14 'Segment Reporting'** ".

(*para. 85, Compliance with International Accounting Standard, SSAP 2.126*)

2.4 Overview

The focus of this study is the period up until 31 December 2000 when the new Hong Kong **SSAP 26** was introduced. Up until then segmental disclosure was non-mandatory and only covered by AG6 the guidance statement. Examination of this period allows us to ascertain the motivations for and the potential value impact of the segmental information under a voluntary regime.

AG6 recommends the disclosure of geographical or principal activity (*para. 10* refers) and the criteria for determining a segment is based on the 10% of:

- (a) the aggregate turnover; or
- (b) the aggregate results of all activities that
 - (i) showed profits; or
 - (ii) showed losses. (*Part 2, para. 9, AG6* refers)

AG6 requires the disclosure of turnover of each principal activity, the consolidated turnover and contribution to trading results of each principal activity (*para. 15* refers). The guideline requires the disclosure of *segment result*, which is the contribution to trading results made by each principal activity or geographical area and is calculated as the difference between *segment turnover* and *segment expense* and reflects operating profit (*para. 13* refers).

The new US standard **SFAS 131** and the revised **IAS 14** were introduced effective December 1997 and June 1998, respectively. This illustrates the considerable importance of segmental disclosure, as it is obviously an area of recent concern. It also reinforces the apparent need to improve the disclosure by reporting on the basis of defined primary segments determined

under managerial reporting rather than industry/geographical segments. Given that this has led to a similar standard being introduced in Hong Kong effective 1 January 2000, this may have provided impetus for the increased voluntary disclosure of segmental information in the period 1997-2000. This is particularly relevant for multi-national corporations (MNC's) and transnational corporations in Hong Kong which, even though they primarily use Hong Kong accounting standards, already have to adhere to overseas standard requirements due to listings on overseas exchanges or equivalently need or want to demonstrate that they comply with **US GAAP** or **IAS**.

Now that I have outlined the regulatory background of segmental reporting in Hong Kong, I turn to describing the available literature documenting the benefits of and motivation for segmental disclosure. Most of these studies concentrate on the U.S market.

CHAPTER 3: Literature Review

Early research on segment reporting has focused on the usefulness of geographical segment data (Balakrishnan, Harris, and Sen 1990; Ahadiat 1992; Boatsman, Behn, and Patz 1993). A majority of research findings provide evidence that geographic segment data enhance the predictive ability of the firm's annual income. However, because prediction of earnings based on geographic segment disclosure alone is exposed to variations from two main sources: *exchange rates risks* and *country-specific growth risks*, the predictive ability of the segment data is considerably weakened (Balakrishnan, Harris and Sen 1990). The growing importance of country and industry risks is also identified by Ijiri (1995). More frequent disclosure of segment data in the interim reports (as prescribed in the new SFAS 131), together with the corresponding updated forecasts due to the changing macroeconomic factors, are expected to improve the usefulness of segmental disclosure in earnings prediction.

Other research considers the *persistence* and the *risk* of each geographical locale when evaluating the usefulness of segmental data (Boatsman, Behn, and Patz 1993). They find that when the unexpected segmental earnings are large, geographical segment disclosures are used. Also, the association between using the geographical segment disclosures and common stock values appears to be highly contextual; it depends on the magnitude of unexpected foreign profits earned, the time periods examined, and the geographical regions selected. In other words, the earnings predictability of the segmental data, based on geographical criteria, has not been clearly established.

Some researchers propose a *portfolio approach* to segment analysis. **Jose and Frank** (1994) argue that the focus on profitability of traditional segment analysis provides the user with information that may be somewhat useful but problematic in interpretation. They propose a *segment cash flows approach*, with a view to identifying segments characterized as cash provider or cash user. Adapting the Growth Share Matrix originating from the Boston Consulting Group (BCG) work in strategic management, **Jose and Frank** develop segment cash flows statements to identify which segments are to be classified as 'CASH COW', 'QUESTION MARK', 'STAR' and 'DOG'. By means of focusing on segment cash flows and management's investment strategy regarding a segment, the information user is believed to be better able to consider future prospects and performance of both the lines of business and of the firm. They did not, however, propose a model to link up the valuation of the firm with their segmental cash flows statements.

Other researchers identify relationships between the firm's *willingness* to disclose segment data and the appropriate *level of aggregation* in segmental disclosures, given the presence of a competitor on the one hand and the regulatory flexibility for each enterprise to present its own circumstances on the other (**Darrough and Stoughton** 1990, **Wagenhofer** 1990, **Feltham and Xie** 1992). **Hayes and Lundholm** (1996) find that, as they have superior private information about the future performance of their firm's activities, the managers would choose a specific strategy to aggregate the firm's different activities into reportable segments *after taking the rival's possible actions into account*. A firm is more willing to report its segments separately when the segment with the more permanent earnings series has the better performance signal. The rationale being that the firm wants to distinguish itself from others whose

relatively good signal is from a more transient series. Moreover, their model shows that as the heterogeneity in earnings persistence increases, the probability of segment disclosure decreases when the firm's future economic profits are threatened by its rivals' responses to such disclosure.

The relationship of increased disclosure of information and lower cost of capital is also well documented in many research studies (**Verrecchia 1983, Merton 1987, Diamond and Verrecchia 1991, Healy and Palepu 1993, Frankel, McNichols, and Wilson 1995**). **Verrecchia (1983)** develops a model of discretionary disclosure that shows an equilibrium threshold level of disclosure exists. Investors will discount the value of a firm to the point that the manager is better served by disclosure. **Merton (1987)** suggests a 2-period capital market equilibrium model under incomplete information about the firm's securities. **Diamond and Verrecchia (1991)** find that policies to reduce a firm's asymmetry of information will increase the liquidity of the market for its securities.

Frankel, McNichols, and Wilson (1995) document a positive association between firms' tendencies to access capital markets and to disclose earnings forecasts. Their findings suggest that firms try to mitigate consequences of differential information through disclosure. In short, managers have incentives to increase the visibility of their firms' securities. They release information about their operations to communicate with investors because they view disclosure as valuation-relevant, with the purpose to influence the capital market participants.

As industry segment reports are a premier financial disclosure and represent a primary source of information about corporate opportunities and risk (AIMR 1993, AICPA 1994), the total number of segments disclosed in the annual reports should be a fair and objective indicator of the disclosure level. **Conover and Wallace** (1995) report that the more detailed the segmental disclosure, the higher the return earned in the stock market. Based on the disclosure practices of U.S.-domiciled multinational firms, they find empirical evidence showing that there is a positive relationship between the extent of geographic segment information released and the firm's equity market performance.

Trueman (1996) demonstrates that the firm's manager has higher expectations of the firm's share price when the number of analysts following the firm is increasing. This relation is a direct result of market participants' inability to observe the number of informed traders in the market. Moreover, the purchase of shares after good news is more likely than sale of shares after bad news. He concludes that the manager can vary the precision of the information given to analysts, thus influencing their interest and the manager's expectation of the firm's share price. In equilibrium, he shows that the manager will choose a precision level greater than that which maximizes analyst following, but in many cases less than its largest possible value.

Botosan (1997) studies the annual reports of 122 manufacturing firms for their disclosure level, which is not necessarily confined to segmental disclosure. She finds that, for firms that attract a small number of analysts following, the *greater* discretionary information disclosure is associated with a *lower* cost of equity capital. A negative association between cost of equity capital and voluntary disclosure level

exists. However, with firms with a high level of analyst following, the association between level of disclosure and cost of equity capital is absent. She acknowledges that her disclosure measure (DSCORE) is limited to the information provided in the annual report only. Accordingly, the measure may not yield a powerful proxy for overall disclosure level when a substantial amount of information is disseminated through financial analysts for those firms with high number of analysts following.

Harris (1998) uses a logit model to assess whether management's decision to disclose a firm's operations in a segment is associated with 2 measures: *competition* (by means of concentration ratios) and the within-firm range of industry estimates of *earnings persistence*. She finds that when a firm operates in *less* competitive industries, such industries are *less* likely to be reported as industry segments. Since abnormal profits are more likely to incur in less competitive industries, managers attempt to conceal information that would allow rival firms to capture these profits. There is also evidence supporting the assertion that, as within-firm heterogeneity in earnings persistence increases, the probability of segment disclosure decreases. The end result is that managers may in fact choose to maximize shareholder value by not reporting segment operations with diverse earnings persistence because the cost of revealing this information to rivals exceeds the value to users of more accurate earnings forecasts.

Piotroski (1999) provides a linkage between the observed valuation revisions of a firm and its reported financial information. He investigates 423 firms that choose to improve segment reporting fineness, as defined as the increase in the number of individual reported segments relative to the prior fiscal year, between 1989 and 1995.

He documents that a discretionary increase in the number of segments reported is positively related to the revisions of earnings forecast and also the market-adjusted returns of the firms' stock. He also notices that firms are opportunistically motivated in disclosing segmental information. In his sample, 62% of the newly reported segments exceeded consolidated performance, while most of the remaining new segments appear to represent small, immaterial operations in weak industries. He concludes that managers who choose to report a new segment are trying to disseminate good news about the firm's operations. His findings are consistent with the view that more segment disclosures are associated with a lower average cost of capital and a greater expected persistence of future earnings.

Botosan and Harris (2000) examine the factors and effects of managers' decisions to increase segment disclosure *frequency*. They study 107 multi-segment firms that reported industry segment data between 1987 and 1994. They find that during the two years ending prior to the year of the disclosure change, change firms experienced a decline in liquidity as measured by trading volume, and an increase in information asymmetry as measured by analyst forecast consensus. They also document that those change firms experienced increased analyst following after the onset of voluntary quarterly segment reporting (i.e. before **SFAS No. 131** took effect).

All these studies point in the same direction that firms stand to benefit from an increase in the firms' disclosure level. By disclosing more information to the capital market more frequently, the managers reduce the information asymmetry, lower the transaction costs, decrease the uncertainty discount in the stock price, and thereby yield a lower cost of equity capital (**King, Pownall, and Waymire 1990**). Managers

can also increase the visibility of their firms' securities by more voluntary disclosure, thus attracting more analyst following (**Diamond and Verrecchia** 1991; **Lang and Lundholm** 1996). Increased liquidity, measured as a narrowing in relative bid/ask spreads of the firms' stocks, will take place following an increase in analysts' disclosure ratings (**Healy, Hutton, and Palepu** 1999).

Other research studies look at the costs of providing more discretionary segment disclosure. **Lev** (1992) classifies the costs of disclosure into two categories: the *direct* costs and the *indirect* costs. The direct costs comprise the costs of collecting, processing, and disseminating the information. The indirect costs include those resulting from the impact of disclosures on company decisions and activities, the competitive position costs, and litigation costs. While it is apparent that the direct costs are costly, the indirect costs can also be substantial. **Pacter** (1993) points out that one of the economic costs attributed to the disclosure of segment data is the loss of multi-segment firms' competitive advantage, though this assertion has not been empirically tested.

Gigler (1994) uses a theoretical model to demonstrate that, under the circumstances where dishonest or incomplete voluntary disclosure is allowed, managers may increase voluntary disclosures as proprietary costs increase. This is a result of the manager's trading off a wish to communicate optimistically to the capital market but pessimistically to the competitor. Specifically, such trade-off can make a firm's optimal disclosure believable and informative to both the capital market and the competitor.

Hayes and Lundholm (1996) construct a 2-segment model and find that managers do consider their rival firms' reactions in their decisions on segment disclosure. Under severe competition, the firm's value is highest when the managers disclose that all segments have similar financial results. By disclosing information in this case, a firm can avoid the adverse selection in the capital market and yet its competitors may learn very little. In a partial disclosure equilibrium, only firms with sufficiently similar payoffs for their two-segment activities report separate segment data. When the future payoffs for the two activities are disparate, firms report only aggregate data. This act is to prevent competitors from identifying the more lucrative market, and managers protect excess profits by non-disclosure.

However, how much emphasis a manager places on the importance of proprietary information disclosed to competitors may be influenced by the culture. **Gray** (1988) proposes a hypothesis that secrecy and its impact on disclosure behaviour is a function of the cultural values identified by **Hofstede** (1984). **Gray** argues that secrecy can be linked most closely with the uncertainty avoidance, power distance, and individualism dimensions. **Gray and Vint** (1995) suggest that the degree of secrecy or transparency tend to vary across countries with resulting differences in the amount of information publicly disclosed. Cultural factors underpin or underlie explanations of disclosure behaviour of an institutional nature.

Zarzeski (1996) undertakes a cross-cultural study of 256 firms in 7 countries/economies (in which Hong Kong is also included). She finds that the secretiveness of a culture does underlie disclosure practices of its business enterprises. She finds evidence that market forces affect disclosure behaviour in 3 ways: first,

higher levels of relative foreign sales relate to higher levels of disclosure. Second, lower debt ratios relate to higher disclosure, which indicates that firms with more debt are likely to disclose *less* public information. Third, larger firms tend to disclose more information. However, her sample of Hong Kong firms consists of 29 firms only, and unlike the overall sample result, the sign of the coefficient of the debt ratio for Hong Kong firms is positive. In her study, she also notices that Hong Kong firms explain the least amount of disclosure variation that occurs in their corporate annual reports (the adjusted R^2 being 0.06, whereas the next smallest one is Germany (0.19), and U.S. has the highest (0.49)).

Should cultural differences have an impact on the practice of voluntary disclosure, then empirical studies have to be undertaken at individual country/economy level in order to justify the theories and models so far developed mainly from the U.S. data. My current study aims at determining whether Hong Kong listed companies disclose segment information differently. The findings should contribute evidence as to whether segmental disclosure and the motivation thereof is the same or different to that in culturally diverse markets. This has implications given the move to achieve a global harmonisation of accounting standards.

CHAPTER 4: Sample Selection and Descriptive Statistics of Segmental Disclosure

In this chapter, I describe three items: (i) my sample, (ii) the source of my sample, and (iii) how the firms in my sample report their segmental disclosure. Research Question 1 is stated below:

Research Question 1:

How many segments does a listed firm in Hong Kong disclose and has the degree of segmental disclosure changed over time?

4.1 Sample Selection and Segment Data Source

The segmental disclosure data are obtained from the SEQUENCER database. SEQUENCER (which was formerly known as EXTEL CARDS and is now renamed HYDRA) contains the balance sheets and the income statements of all listed firms on the Stock Exchange of Hong Kong. Most relevant for our purposes, SEQUENCER captures the number of segments by activities and/or geographical areas for each listed firm. It records the contents of such information according to the precise format that the firm presents in its annual report available at that time. The SEQUENCER database enters the financial statement data into the database over time (with some delay) based on the data presented in the firm's actual annual report. To satisfy that the data are correct, several of the data entries from SEQUENCER were sourced to the annual reports to verify their accuracy.

In addition to the segmental disclosure information, SEQUENCER contains financial and operational information of these firms. It classifies them by their single most relevant main core activity: (1) Industrials, (2) Consolidated Enterprises, (3) Properties, (4) Finance, (5) Hotels, (6) Utilities, (7) Others, and (8) N/A -not available or not specified. It also provides the 4-digit SIC codes of all the various industries that the firm is considered to be engaged in. It is important to note here that the SIC codes given encompass many industries and that each company may have more than one SIC code.

4.2 Data Collection

The segmental data were extracted from the SEQUENCER database based on all the data that were available as at May 2001. The data download consists of some 754 companies, all of which were actively traded on the Hong Kong Stock Exchange and had their annual reports available to the public at least at some point over the period 1991-2001.

The sample is reasonably comprehensive as at May 2001. SEQUENCER captured most listed firms whose last reported fiscal year-end was as late as 31 December 1999. SEQUENCER had available 364 firms with fiscal year-end in Year 2000 that had issued their latest (Year 2000) financial reports and SEQUENCER had already compiled the data in electronic form. However, the lag time of data entry suggests that most of these companies were not recent reports for the 2000 year. As an example, only 43 companies with December 2000 year-ends had data recorded in SEQUENCER by May 2001. Exhibit 4.1 shows an industry breakdown of the original data available from SEQUENCER.

Exhibit 4.1**Original Sequencer Data Breakdown by Industry**

By Industry	No.	%	No. of Firm-years	%
Industrials	247	32.8	1271	34.7
Consolidated Enterprises	210	27.8	1091	29.8
Properties	101	13.4	532	14.5
Finance	47	6.2	238	6.5
Hotels	13	1.7	74	2.0
Utilities	12	1.6	59	1.6
Others	12	1.6	50	1.5
N/A	112	14.9	344	9.4
Total:	754	100.0	3659	100.0

In Exhibit 4.2, we can see that the original sample comprised firms listed on the Main Board, 'H' Shares (issued by firms domiciled in mainland China), GEM Stocks (Growth Enterprise Market), and NASDAQ stocks traded in Hong Kong. The data contained 46 'H' Shares, 36 GEM Market Shares, and 4 NASDAQ Stocks (Dell Computer, Intel Corporation, Microsoft Corporation, and Starbucks Corporation) listed and traded on the Hong Kong Stock Exchange (see Exhibit 4.2 below).

Exhibit 4.2**Original Sequencer Data breakdown by Types of Shares, and by Industry**

	Main Board	'H' Shares	Gem Market	NASDAQ Shares	Total
Industrials	222	25	0	0	247
Consol. Enterprises	207	3	0	0	210
Properties	100	1	0	0	101
Finance	47	0	0	0	47
Hotels	13	0	0	0	13
Utilities	8	4	0	0	12
Others	11	1	0	0	12
N/ A	60	12	36	4	112
Total	668	46	36	4	754

From the original data set, four types of listed firms are excluded. First, those companies classified as Finance companies in SEQUENCER are mainly banks and deposit-taking companies. They are governed by the regulations of the Hong Kong Monetary Authority under the Banking Ordinance and therefore their disclosure patterns are influenced by those requirements. In my analysis of segmental reporting, these 47 Finance firms are not included.

Second, the 'H' Shares, the GEM Market Shares, and the NASDAQ Stocks have their own specific compliance requirements on disclosure practice for their respective trading markets and are therefore also excluded from my current analysis. Of the original 754 firms (3659 firm-years), this leaves me with a net sample of 621 Main Board listed companies (3124 firm-years). The net sampling frame and the distribution of the companies and their respective industries are shown in Exhibit 4.3a below.

Exhibit 4.3b examines the data across industry and calendar year. In terms of available data, 89% of the data appearing in SEQUENCER covers a 5-year span from 1995 to 1999. Only 1% of the original data provided is prior to 1995 (i.e. from 1991 to 1994) and only 10% are from Year 2000. SEQUENCER only began recording company data on a comprehensive and systematic basis in 1995 and those data prior to 1995 are only provided by select firms who provided such data on a voluntary basis for comparison. The low percentage of data in year 2000 is simply due to: (i) the fact that my search of the SEQUENCER data base took place in May 2001 which meant only a portion of firms

had issued their year 2000 reports and (ii) the lag time of compiling such data into the SEQUENCER data base.

Exhibit 4.3a: All Main Board, non-finance, listed firms: 621 companies

Industry Type	No. of firms	%	No. of Firm-years	%
Industrials	222	35.8	1165	37.3
Consol. Entprses	207	33.3	1075	34.4
Properties	100	16.1	528	16.9
Hotels	13	2.1	74	2.4
Utilities	8	1.3	43	1.4
Others	11	1.8	44	1.4
N/A	60	9.6	195	6.2
Group Total	621	100.0	3124	100.0

Exhibit 4.3b: Firm-year entries, by industry type, by year: 3124 entries

Industry Type	Year										Total Firm-year
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	
Industrials	0	1	2	4	176	199	220	221	222	120	1165
Consol. Entprses.	0	0	1	6	165	184	203	203	199	114	1075
Properties	0	0	2	8	86	93	99	100	95	45	528
Hotels	0	1	1	1	11	12	12	13	13	10	74
Utilities	0	0	0	0	6	8	8	8	8	5	43
Others	1	1	1	0	5	5	8	8	10	5	44
N/A Firms	0	1	1	2	9	18	34	50	54	26	195
Total	1	4	8	21	458	519	584	603	601	325	3124

Note: The relatively small number of entries from 1991 to 1994 (total 36 firm-years) is due to the fact that in SEQUENCER only 22 companies reported such backdated data. SEQUENCER only started providing a comprehensive and systematic coverage from 1995 onwards.

4.3 Segmental Disclosure of Sample Firms – An Overview

The new SSAP 2.126 (alias SSAP 26 as all statements are grouped under **Section 2.1: Statements of Standard Accounting Practice** of the HKSA's Members' Handbook) was not mandatory for those firms with fiscal year-ends before 1 January 2001. Therefore, as noted previously, the firms' segmental information prior to that date need only require compliance with the former Hong Kong Accounting Guideline **HKAG2.06 Reporting Financial Information by Segment**. To the accounting practitioners and the members of the HKSA, Accounting Guidelines are regarded as "highly recommended" but not "mandatory". It is less compelling than a Statement of Accounting Practice (such as the **SSAP 26**) and a firm has discretion to abide by the Accounting Guidelines or not. Therefore, any disclosure about the segments as required by the Guideline can be regarded as voluntary, although there may exist powerful incentives to disclose such information.

Some companies in their reports omit the number of segments. For example, a firm Albatronics Far East Co. Ltd. disclosed segments under the business analysis from Year 1994 to 1998 (see Appendix IIa) but it only disclosed segments under the geographical analysis from 1995 to 1998 (see Appendix IIb). The entries under year 1994 are considered as 'Not reported' rather than zero so as to distinguish them from those situations where firms did specifically disclose the number of segments as '0'. In my sample, there are 57 cases that are identified as "Not reported" rather than zero (e.g. the differentiation of "Not reported" from "zero disclosure" can be seen from Appendix VIb:

The Cross-Harbour (Holdings) Ltd. from Years 1997 to 1999. Also, see Appendix VIIa: Theme International Holdings Ltd. for Years 1996, 1999 and 2000.) The breakdown by types of industry of such “Not reported” cases is shown in Exhibit 4.4.¹

Among the 621 main board listed firms with 3124 firm-years observations, the distribution of disclosed segment groups is as follows:

Exhibit 4.4:

Total Number of segments disclosed, by industry, and by segment group: 3124 firm-years

Mean = 10.7

Median = 10.0

Standard Deviation = 8.11

No. of Segments	<i>Industry</i>							Total
	Indus-trials	Consol. Entprs.	Properties	Hotels	Utilities	Others	N/A	
0	195	170	115	12	25	8	38	563
1-5	161	95	56	12	3	9	61	397
6-10	176	225	134	16	10	8	51	620
11-15	232	219	100	12	0	10	15	588
16-20	237	191	66	7	0	2	17	520
21-25	102	108	43	6	0	2	4	265
26-30	32	37	9	1	0	4	5	88
31-35	6	8	1	0	0	0	0	15
36-40	1	3	0	4	0	0	0	8
41-45	0	1	0	1	0	0	0	2
46-50	0	1	0	0	0	0	0	1
Sub-total	1142	1058	524	71	38	43	191	3067
Not- reported	23	17	4	3	5	1	4	57
Grand Total	1165	1075	528	74	43	44	195	3124

There are 563 entries (18% of total) that disclose zero segments. Except for this group, the modal range for all firms is 6 to 10 segments. However, for those Industrial companies, the modal range is 16 to 20 segments, being the highest among the 7 different

¹ When a blank in SEQUENCER (basically no info) occurs, it is classified as: (i) N/A or not reported if there is no other information in prior years for that category but there was information in the same year (for a different category); (ii) if there is other segment information in prior years it is recorded as 0.

industries. As for the Utilities companies, the modal range is 0; which indicates that a majority of these firms did not disclose any segments at all. The frequency chart is depicted in Exhibit 4.5 below and it can be seen that, taken all kinds of segments together, firms in my sample most likely disclosed 6 to 10 segments – business and geographical combined – over the sampling period:

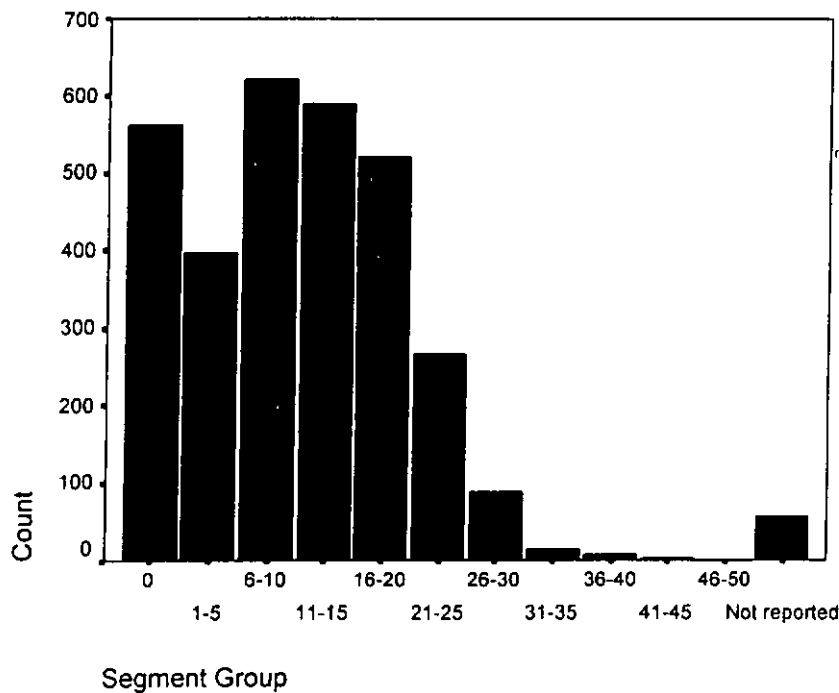
Exhibit 4.5

**Frequency Chart: Segment groups disclosing various numbers of segments:
3124 firm-years**

Mean = 10.7

Median = 10.0

Standard Deviation = 8.11



The mean number of segments disclosed is 10.7 (median 10.0). However, this number is the arithmetic mean of *all* the segments a typical firm discloses in *all* the categories combined as recorded in SEQUENCER, i.e.:

- (1) segments by turnover (by business analysis),
- (2) by profit-before-tax (by business analysis),
- (3) by net assets (by business analysis),
- (4) by total assets (by business analysis),
- (5) turnover by source or market (by geographical analysis),
- (6) profit-before-tax by source or market (by geographical analysis),
- (7) by net assets (by geographical analysis), and
- (8) by total assets (by geographical analysis).

Therefore, a single, all-embracing statistical measure such as mean or median of all *combined* segments without regard to the characteristics of individual industries may not be representative of the disclosure behaviour of the various types of firms in my sample. The measure needs to be split up according to the categorization of the segmental information.

SEQUENCER categorized the segmental information on 2 major dimensions: **Business Analysis** and **Geographical Analysis**. Along each dimension, SEQUENCER further recorded the firm's segmental disclosure of 'Profit-before-tax', 'Net Assets', and 'Total Assets' provided that such breakdown was voluntarily furnished with details by the companies for the corresponding years (e.g. China Motion Telecom International Ltd., see **Appendix I**). Some firms disclosed their 'Turnover' on the business analysis dimension, or 'Turnover by Source' on the geographical analysis dimension, or on *both* dimensions at the same time (e.g. Van Shung Chong Holdings Ltd., see **Appendix VI**). Again, there are firms that disclose both turnover and profit-before-tax on business

analysis dimension, on geographical dimension, or on both. To summarize the various combinations of disclosure patterns in my sample data, I detail the possible combinations a listed firm in Hong Kong disclosed its segments voluntarily as per the format shown in Exhibit 4.6.

Exhibit 4.6

Ways that a Hong Kong listed company disclosed its segmental information in SEQUENCER

	(A) by Business Analysis	(B) by Geographical Analysis
(1) by Turnover	No. of segments by year	No. of segments by year
(2) by Profit-before-tax (P-b-T)	No. of segments by year	No. of segments by year
(3) by Total Assets	No. of segments by year	No. of segments by year
(4) by Net Assets	No. of segments by year	No. of segments by year

Given such a wide choice of flexibility in disclosing the segmental information both in width (by business or geographical analysis) and in depth (turnover, profit-before-tax, total assets, net assets), a listed firm in Hong Kong may divulge different scopes and extents of segmental information to the market.

To address my Research Question 1 and describe how the firms behave in their segmental disclosure over the years, it is necessary to streamline my gross sample set and report the firms' disclosure patterns in accordance with the framework as prescribed in Exhibit 4.6 above. Because of the incomplete records of SEQUENCER entries for firm-years before 1995, I do not include the entries prior to Year 1995 into my final sample for analysis. The final sample set and window for my study is described in the following Section 4.4.

4.4 Final Sample Set and Window

My original sample set as collected from SEQUENCER contains 621 firms with 3124 firm-year observations spanned over a period of 10 years from 1991 to 2000 (see Exhibit 4.3b on page 30). However, because the observations from 1991 to 1994 are too few to be reliable (only 34 in total), I decide to truncate them off and concentrate on the period from 1995 to year 2000. That gives 620 firms and 3090 firm-year² observations in the final sample as shown in Exhibit 4.7:

Exhibit 4.7a: Final Sample Set: All Main Board, non-finance, listed firms: 620 companies

Industry Type	No. of firms	%	No. of firm-years	%
Industrials	222	35.8	1158	37.5
Consol. Entprses	207	33.4	1068	34.5
Properties	100	16.1	518	16.8
Hotels	13	2.1	71	2.3
Utilities	8	1.3	43	1.4
Others	10	1.6	41	1.3
N/A	60	9.7	191	6.2
Group Total	620	100.0	3090	100.0

Exhibit 4.7b: Final Sample Set: Firm-year entries, by industry, by year: 3090 entries

Industry Type	Year						Firm-year Total
	1995	1996	1997	1998	1999	2000	
Industrials	176	199	220	221	222	120	1158
Consol. Entprses.	165	184	203	203	199	114	1068
Properties	86	93	99	100	95	45	518
Hotels	11	12	12	13	13	10	71
Utilities	6	8	8	8	8	5	43
Others	5	5	8	8	10	5	41
N/A	9	18	34	50	54	26	191
Total	458	519	584	603	601	325	3090

² The only company that was excluded from the final sample set is Rhino International Holding Ltd. (Industry type = Others) whose data from 1994 onwards were no longer present in SEQUENCER.

4.5 Business Segments

Of these 3090 firm-years, the cross tabulations of the segmental disclosure by industry and by two main criteria: business analysis segments by turnover, and by profit-before-tax, are shown in Exhibits 4.8a and 4.8b below.

Exhibit 4.8a:

Cross Tabulation of Business Analysis Segments by Turnover, and by Industry

No. of business segments by turnover	Industry							N/A	Total
	Industrials	Consolidated Enterprises	Properties	Hotels	Utilities	Others			
0	437	285	191	17	21	11	49	1011	
1	18	14	15	0	0	0	1	48	
2	159	168	32	9	0	13	40	421	
3	226	214	80	27	8	7	73	635	
4	168	151	73	5	5	4	18	424	
5	74	113	48	0	0	1	4	240	
6	42	57	44	9	0	1	0	153	
7	4	32	18	1	0	3	0	58	
8	0	11	13	0	0	0	1	25	
9	0	3	0	0	0	0	0	3	
10	0	1	0	0	0	0	0	1	
11	3	1	0	0	0	0	0	4	
Not reported	27	18	4	3	9	1	5	67	
Total	1158	1068	518	71	43	41	191	3090	

Exhibit 4.8b:

Cross Tabulation of Business Analysis Segments by Profit-before-tax, and by Industry

No. of business segments by P-b-T	Industry							N/A	Total
	Industrials	Consolidated Enterprises	Properties	Hotels	Utilities	Others			
0	512	365	168	19	24	16	122	1226	
1	1	0	1	0	0	0	0	2	
2	14	20	3	0	0	0	2	39	
3	56	66	15	5	2	3	7	154	
4	92	109	41	4	3	2	13	264	
5	169	118	85	13	0	5	22	412	
6	139	120	65	6	5	8	9	352	
7	87	103	54	9	0	2	8	263	
8	40	86	34	8	0	0	2	170	
9	13	35	27	3	0	0	0	78	
10	4	21	13	1	0	3	0	42	
11	1	3	5	0	0	1	1	11	
12	0	0	3	0	0	0	0	3	
13	0	1	0	0	0	0	0	1	
14	3	1	0	0	0	0	0	4	
Not reported	27	20	4	3	9	1	5	69	
Total	1158	1068	518	71	43	41	191	3090	

It can be seen from Exhibits 4.8a and 4.8b above that firms in Industrials, Consolidated Enterprises, and Properties industries disclosed more varied business segments by turnover or by profit-before-tax than firms in other industries. This may be attributable to the characteristics of the industry a firm belongs – when there were principal activities clearly identifiable, firms might choose to reveal more business segments along these activities. However, firms in my sample preferred revealing segmental turnover to profit-before-tax, than by net assets or total assets (see Exhibits 4.9a to 4.9e below):

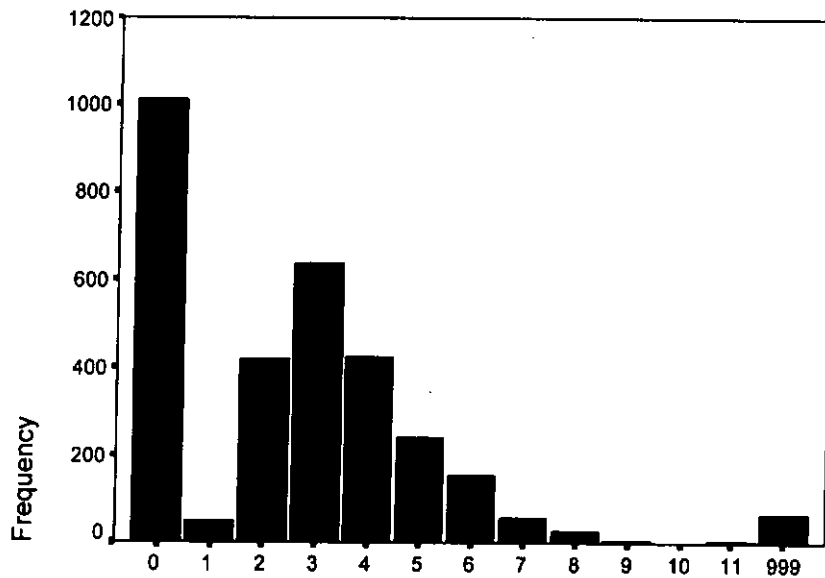
Exhibit 4.9a
Summary of Disclosure Pattern – by Business Analysis

	by Business Analysis			
	Zero/ Nil disclosure	One segment disclosed	Two or more segments disclosed	Total firm-years
(1) By turnover	1078	48	1964	3090
(2) By profit-before-tax	1295	2	1793	3090
(3) By net assets	3068	2	20	3090
(4) By total assets	3090	0	0	3090

Exhibit 4.9b
Frequency of Disclosed Segments – by Business Analysis

No. of Segments	(1) By turnover		(2) By P-b-T		(3) By Net Assets	
	Frequency	%	Frequency	%	Frequency	%
Not discl.	67	2.2	69	2.2	3053	98.8
0	1011	32.7	1226	39.7	15	0.5
1	48	1.6	2	0.1	2	0.1
2	421	13.6	39	1.3	0	0.0
3	635	20.6	154	5.0	2	0.1
4	424	13.7	264	8.5	4	0.1
5	240	7.8	412	13.3	3	0.1
6	153	4.9	352	11.4	6	0.2
7	58	1.9	263	8.5	3	0.1
8	25	0.8	170	5.5	0	0.0
9	3	0.1	78	2.5	0	0.0
10	1	0.0	42	1.4	0	0.0
11	4	0.1	11	0.4	0	0.0
12	0	0.0	3	0.1	1	0.0
13	0	0.0	1	0.0	0	0.0
14	0	0.0	4	0.1	1	0.0
Total Firm-Years	3090	100.0	3090	100.0	3090	100.0

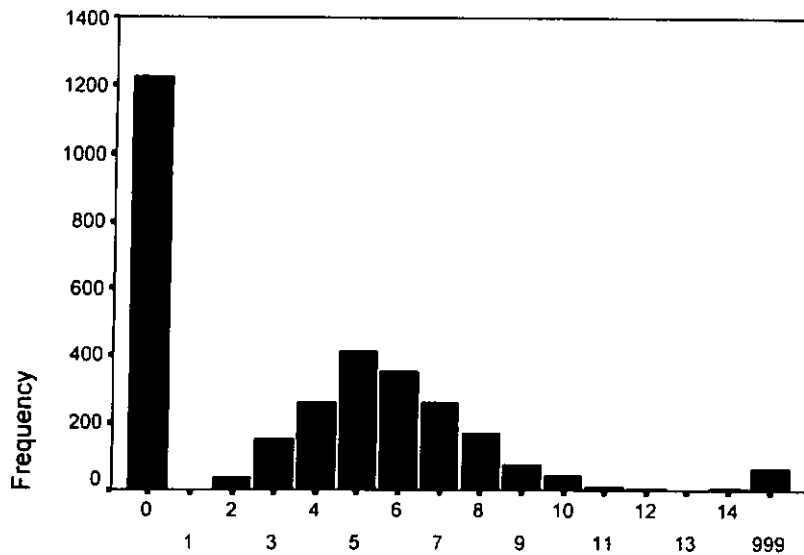
Exhibit 4.9c
Segments by Business Analysis—Frequency by Turnover



Business Analysis Segments by Turnover

999 = Not disclosed

Exhibit 4.9d
Segments by Business Analysis—Frequency by Profit-before-Tax



Business Analysis Segments by P-b-T

999 = Not disclosed

Exhibit 4.9e
Segments by Business Analysis—Descriptive Statistics

No. of segments	Business Analysis		
	By turnover	By P-b-T	By Net Assets
Mean	2.41	3.42	3.30
Median	3.0	4.0	3.0
Stand. Dev.	2.11	3.18	3.57
Min.	0	0	0
Max.	11	14	14

As can be seen from Exhibit 4.9a to Exhibit 4.9e above, the highest frequency is zero disclosure or not disclosed. Excluding this zero-segment category, the next highest frequency of segments disclosed is three segments by Turnover, five segments by Profit-before-Tax, and six segments by Net Assets. No firms under the business analysis dimension disclosed any segments by Total Assets.

As the Accounting Guideline **AG6** was the prevailing accounting guideline during this sampling period, by nature it was a recommended accounting practice and was not compulsory (for the members of HKSA). The management of listed firms (including those certified accountants) had a large flexibility in adopting this guideline. The only legal requirement stipulated in **AG6** was stated in its Part 4—Legal Requirements in Hong Kong, which is recapped as follows:

“Paragraphs 4 (1)(a) and (b) of the undertaking prescribed under the Securities (Stock Exchange Listing) Rules 1986 require disclosure of the following:

- (a) a description of the principal activities of the Company and its subsidiaries and, where two or more such activities are so described, a statement giving in respect of each such activity the turnover and contribution to trading results attributable to it; and

- (b) a geographical analysis of consolidated turnover and contribution to trading results of trading operations carried on by the Company and its subsidiaries outside Hong Kong unless such operations comprise less than 10 per cent of the turnover and 10 per cent of the trading results of the Company and its subsidiaries.” (Part 4, *para. 25*, AG6 refers)

In other words, those listed firms voluntarily providing segmental information during this period were only required to meet the statutory requirements under the Securities Rules. As revealed by my summary of statistical descriptions in Exhibit 4.9a (page 38), most of the firms did not disclose in accord with it. For example, ASM Pacific Technology Ltd. disclosed 12 geographical segments but nil business segments throughout the period 1995 to 1999 (see Appendix VIII). City E-Solutions Ltd, on the other hand, faithfully revealed 14 geographical segments by turnover by source, as well as 14 geographical segments by profit-before-tax by source, but nil business segment (see Appendix IX).

Either the firms misunderstood the legal requirements by not giving a statement of each activity on turnover *and* trading results attributable to it; or they elected not to comply strictly with AG6 by exercising their judgement as stipulated in Part 1, *para. 7*:

“Reporting segmented information involves decisions that are based in part on judgement. Such decisions include those about the identification of activities and about the allocation of turnover and expenses to those activities. Information about the bases used in the preparation of segment reporting enhances the user’s understanding of the resulting data.” (Part 1, *para. 7*, AG6 refers).

4.6 Geographical Segments

The disclosures by Geographical Analysis are even more diverse than that by Business Analysis. Here, listed firms have more varied ways to disclose their segments: by Turnover by source, by Turnover by market, by Profit-before-Tax (P-b-T) by source, by Profit-before-Tax by market, by Net Assets, and by Total Assets.

Since the Turnover by source and Profit-before-Tax by source are the two most common approaches of geographical segments disclosure adopted by firms in my sample, a cross tabulation of geographical segments by Turnover by source and by industry is shown in Exhibit 4.9a. A cross tabulation by Profit-before-Tax and by industry is also shown in Exhibit 4.9b.

From these two Exhibits, it can be observed that Industrials, Consolidated Enterprises, and Properties firms tend to report more geographical segments than other industries. However, there is one Hotel firm, City E-Solutions Ltd., which consistently disclosed 12 to 13 geographical segments by Turnover by source, and 14 geographical segments by P-b-T by source every year over the sampling period (see Appendices IXa, IXb). Only one Consolidated Enterprise, Giordano International Ltd., which has operations in fashion retail markets overseas, can match such detailed disclosure (see Appendices Xa, Xb).

A summary of disclosure pattern by geographical analysis is shown in Exhibit 4.10a and the frequency of disclosed patterns of geographical segments in Exhibit 4.10b. The frequency distributions of Turnover by source and P-b-T by source are shown in Exhibits

4.10c and 4.10d respectively. These exhibits support the notion that firms would be more willing to abide by the disclosure requirements as stipulated by AG6 with regards to geographical disclosure where geographical segments were clearly discernible.

Exhibit 4.9a: Cross Tabulation of Geographical Segments by Turnover by Source, and by Industry

Geog. Seg. By Turnover by source	Industry							N/A	Total
	Industrials	Consolidated Enterprises	Properties	Hotels	Utilities	Others			
0	278	323	307	34	32	20	88	1082	
1	6	13	12	2	0	0	1	34	
2	90	157	54	8	2	7	29	347	
3	104	160	45	10	0	11	12	342	
4	171	163	55	5	0	0	16	410	
5	146	85	13	3	0	0	18	265	
6	92	45	8	0	0	2	6	153	
7	47	23	3	0	0	0	2	75	
8	19	9	1	1	0	0	3	33	
9	11	2	0	0	0	0	0	13	
10	12	2	0	0	0	0	0	14	
11	4	2	0	0	0	0	0	6	
12	0	2	0	3	0	0	0	5	
13	0	2	0	2	0	0	0	4	
Not reported	178	80	20	3	9	1	16	307	
Total	1158	1068	518	71	43	41	191	3090	

Exhibit 4.9b: Cross Tabulation of Geographical Segments by Profit-before-Tax by Source, and by Industry

Geog. Seg. by P-b-T by Source	Industry							N/A	Total
	Industrials	Consolidated Enterprises	Properties	Hotels	Utilities	Others			
0	542	498	312	43	32	23	141	1591	
1	7	5	6	0	0	0	0	18	
2	18	22	12	0	2	0	2	56	
3	25	54	32	3	0	1	7	122	
4	61	81	35	3	0	6	6	192	
5	67	110	49	6	0	4	5	241	
6	77	77	23	0	0	2	7	186	
7	74	53	16	4	0	2	1	150	
8	45	35	5	1	0	2	3	91	
9	30	14	1	2	0	0	1	48	
10	20	5	1	0	0	0	0	26	
11	5	4	0	1	0	0	0	10	
12	4	1	0	1	0	0	0	6	
13	1	3	0	3	0	0	0	7	
14	0	0	0	1	0	0	0	1	
Not reported	182	106	26	3	9	1	18	345	
Total	1158	1068	518	71	43	41	191	3090	

Exhibit 4.10a
Summary of Disclosure Pattern – by Geographical Analysis

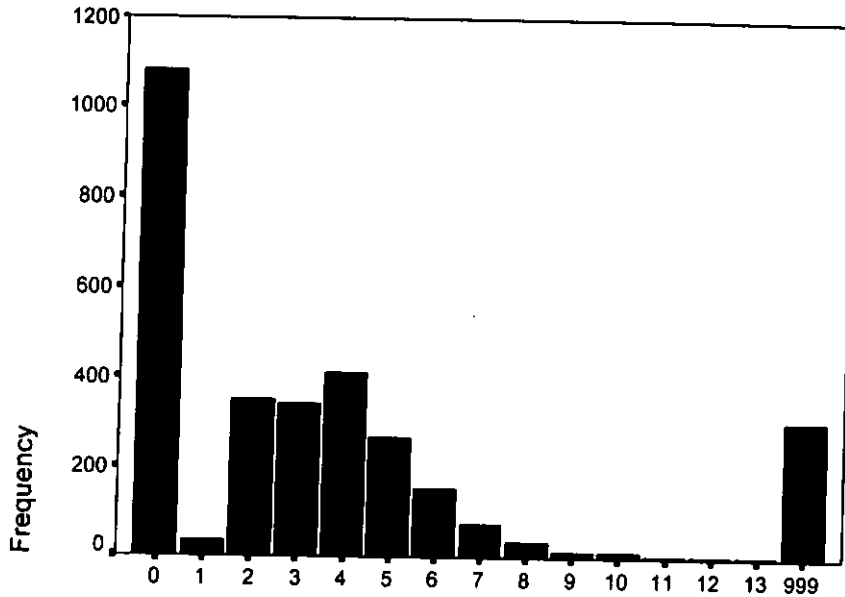
	by Geographical Analysis				
	Zero/ Nil disclosure	One segment disclosed	Two or more segments disclosed		Total firm-years
(1) By turnover by source	1389	34	1667		3090
(2) By turnover by market	2886	0	204		3090
(3) By profit-before-tax (P-b-T) by source	1936	18	1136		3090
(4) By profit-before-tax (P-b-T) by market	2995	0	95		3090
(5) By net assets	3075	0	15		3090

Exhibit 4.10b
Frequency of Disclosed Segments – by Geographical Analysis

No. of Segments Disclosed	(1) Turnover by source		(2) Turnover by market		(3) P-b-T by source		(4) P-b-T by market		(5) Net Assets	
	Frequency	%	Frequency	%	Frequency	Frequency	Frequency	Frequency		
Not discl.	307	9.9	2835	91.7	345	2889	3071			
0	1082	35.0	51	1.7	1591	106	4			
1	34	1.1	0	0.0	18	0	0			
2	347	11.2	35	1.1	56	2	0			
3	342	11.1	37	1.2	122	10	0			
4	410	13.3	34	1.1	192	16	5			
5	265	8.6	38	1.2	241	26	6			
6	153	5.0	27	0.9	186	14	2			
7	75	2.4	8	0.3	150	12	2			
8	33	1.1	7	0.2	91	6	0			
9	13	0.4	5	0.2	48	2	0			
10	14	0.5	7	0.2	26	3	0			
11	6	0.2	5	0.2	10	2	0			
12	5	0.2	1	0.0	6	2	0			
13	4	0.1	0	0.0	7	0	0			
14	0	0.0	0	0.0	1	0	0			
Total Firm-years	3090	100.0	3090	100.0	3090	3090	3090			

Exhibit 4.10c

Segments by Geographical Analysis—Frequency by Turnover by Source

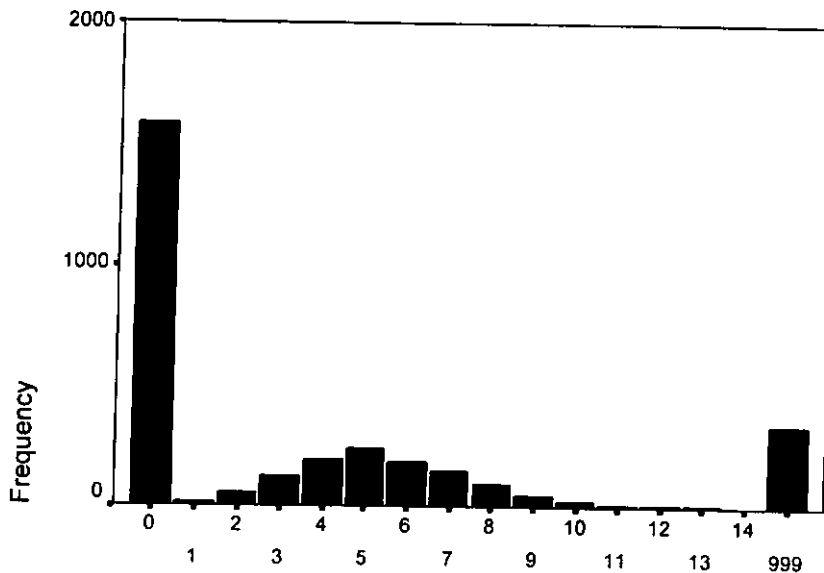


Geog. Analysis Segments by Turnover by Source

999 = Not disclosed

Exhibit 4.10d

Segments by Geographical Analysis—Frequency by P-b-T by Source



Geog. Analysis Segments by P-b-T by Source

999 = Not disclosed

Exhibit 4.10e
Segments by Geographical Analysis—Descriptive Statistics

Geographical Analysis					
No. of segments	Turnover by source	Turnover by market	P-b-T by source	P-b-T by market	Net Assets
Mean	2.47	3.78	2.31	2.68	4.00
Median	2.00	4.00	0.00	0.00	5.00
Stand. Dev.	2.45	2.80	3.05	3.19	2.31
Min.	0	0	0	0	0
Max.	13	12	14	12	7

Exhibit 4.9b (page 38) shows that, when firms disclosed their segments on the Business Analysis dimension, they preferred two choices: (i) to disclose segments by Turnover (65.1%)**, and (ii) by Profit-before-Tax (58.1%). They rarely disclosed by Net Assets (0.7%).

In contrast, on the Geographical Analysis dimension, firms disclosed their segments with their first choice in Turnover by source (55.1%). Other choices of geographical segments disclosure, in descending ranking of popularity, are:

- (i) Profit-before-Tax by source (37.3%);
- (ii) Turnover by market (6.6%);
- (iii) Profit-before-Tax by market (3.0%);
- (iv) Net Assets (0.5%);

(** % in brackets are the percentage of firm-years that disclosed one or more segments.)

As reporting business segments by Turnover and geographical segments by Turnover by Source are the two most popular methods adopted by the firms in my sample, I shall focus on these two choices to address the second part of my Research Question 1 (page 22) in the following section.

4.7 Segment Disclosure Pattern Over the Sampling Period

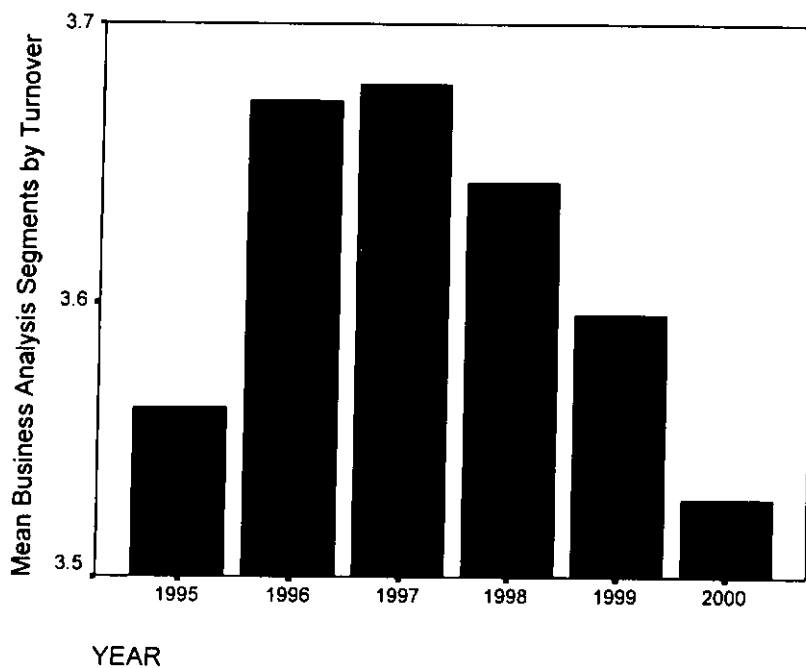
a) Business Analysis Dimension

For those firms reporting one or more business segments (i.e. $BS_{n \geq 1}$) within the period from 1995 to 2000, the mean Business Analysis Segments by Turnover, by year, is shown in Exhibit 4.11a below:

Exhibit 4.11a: Means of Business Analysis Segments by Turnover for firms $BS_{n \geq 1}$

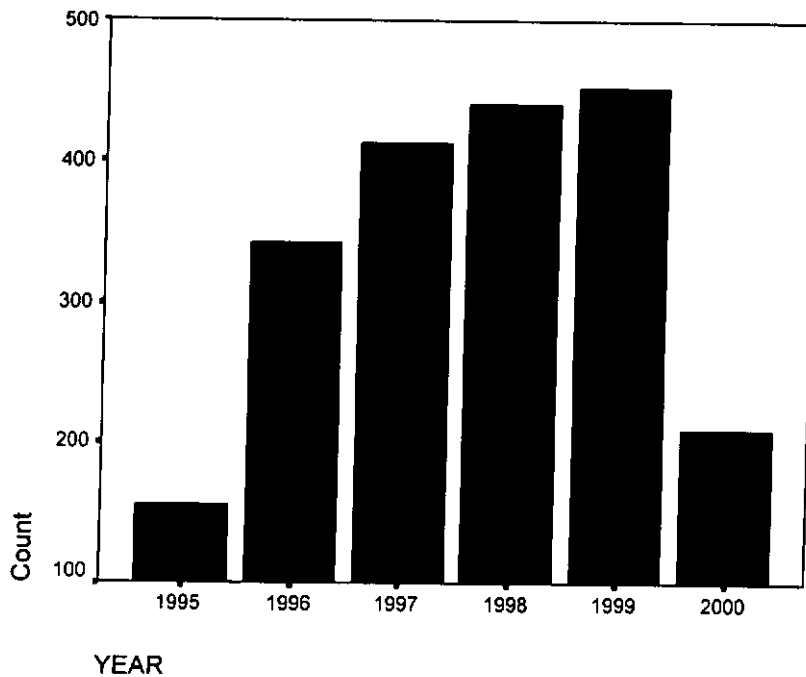
Year	Mean	N	Standard Deviation
1995	3.56	155	1.34
1996	3.67	342	1.39
1997	3.68	413	1.51
1998	3.64	440	1.55
1999	3.60	452	1.54
2000	3.53	210	1.62
Total	3.63	2012	1.50

Exhibit 4.11b: Mean Business Analysis Segments by Turnover for firms $BS_{n \geq 1}$



It can be seen from the Exhibit 4.11b above that the mean segments disclosed are steadily on the rise from 1995 onwards, reaching a peak in 1997, but taper off afterwards. It is interesting to note the decline of mean segments reported in years 1998 and 1999; but the number of firms actually keeps on growing over the previous years (N= 342 in year 1996, 413 in 1997, 440 in 1998, 452 in 1999 and 210 in 2000). The sample size of firms in 2000 is less than in 1999 because of the incomplete capturing of the sample firms' data by SEQUENCER during the sample collection period (see Exhibit 4.11c below):

Exhibit 4.11c: Number of Firms that Disclosed One or More Business Analysis Segments ($BS_{n>=1}$) by Turnover



In other words, there is an upward trend of firms that disclosed one or more business segments. However, the mean business segments disclosed seldom exceeded a threshold of 3.7 segments and it started to decline since 1997.

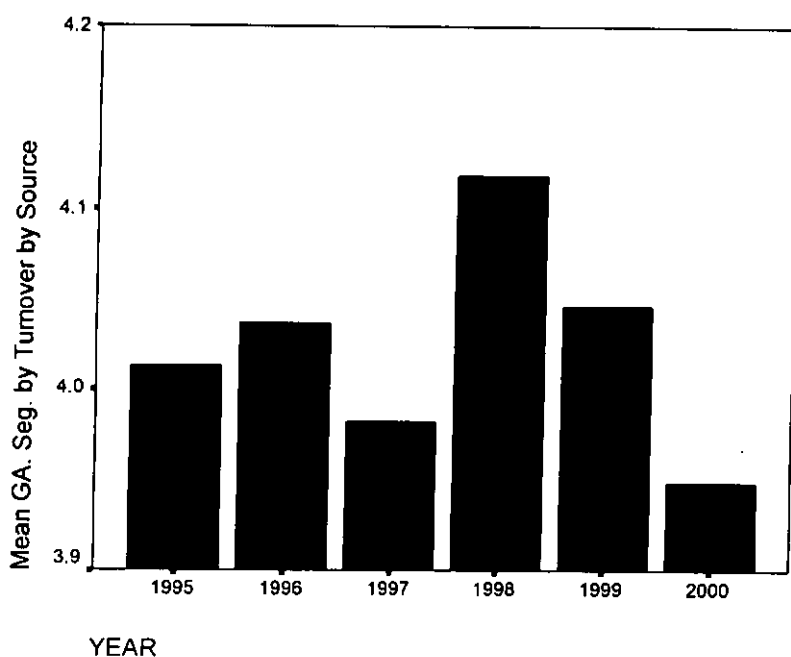
b) Geographical Analysis Dimension

For those firms reporting one segment or more (i.e. $GS_{n \geq 1}$) within the period from 1995 to 2000, the mean Geographical Analysis Segments by Turnover by Source is shown in Exhibit 4.12a:

Exhibit 4.12a: Means of Geographical Analysis Segments by Turnover by Source for firms $GS_{n \geq 1}$

Year	Mean	N	Standard Deviation
1995	4.01	147	2.11
1996	4.04	323	1.90
1997	3.98	349	1.81
1998	4.12	345	1.86
1999	4.05	362	1.89
2000	3.95	175	1.60
Total	4.03	1701	1.86

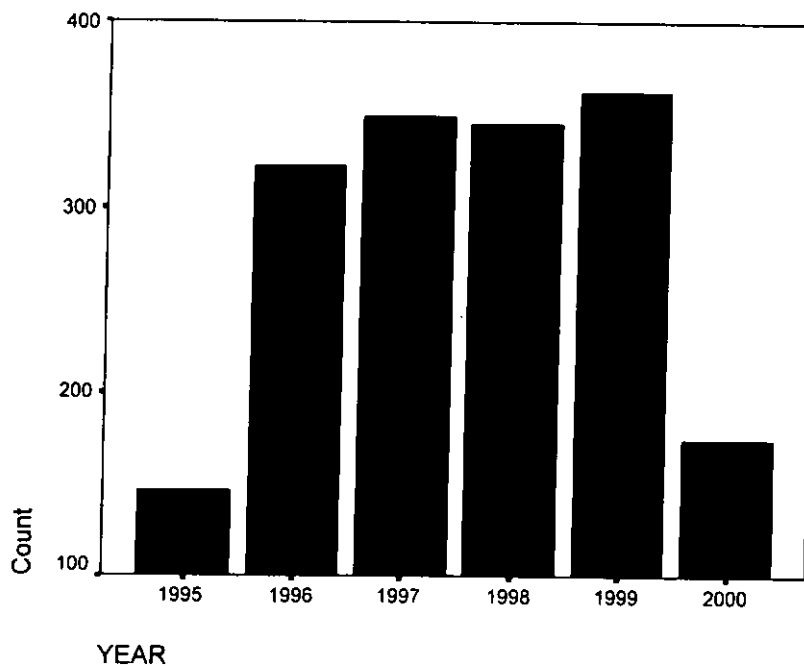
Exhibit 4.12b: Mean Geographical Analysis Segments by Turnover by Source for firms $GS_{n \geq 1}$



In Exhibit 4.12b above, it can be seen that the firms' mean disclosed geographical segments cluster around 4.03 and they also show a generally stable trend from 1996 onwards (there is a slight drop in year 1997). Firms that disclose one or more geographical segments by Turnover by Source are also on the rise (N= 147 in 1995, 323 in 1996; 349 in 1997, 345 in 1998, 362 in 1999, and 175 in 2000. See Exhibit 4.12c below). It indicates that there is increasing number of firms that choose to disclose their segmental information on the Geographical Analysis dimension.

The dip in the mean segments disclosed in year 2000 (3.95 segments) is affected by the incomplete capture of sample firms' data by SEQUENCER (N= 175). The mean disclosed geographical segments might have been comparable to the level in previous years when full information on the listed firms' segmental disclosure became available later on.

Exhibit 4.12c: Number of Firms that Disclosed One or More Geographical Segments by Turnover by Source for firms GS $n \geq 1$



4.8 Conclusion

Since the disclosed segments can be broadly classified along two major dimensions – Business Segments and Geographical Segments as shown in Exhibit 4.6 (page 35), Hong Kong listed firms had a wide discretion to disclose their segments along either dimensions, or both. Some firms' disclosure patterns might be affected by the nature of industry they were in: e.g. if a firm belonged to the Utilities industry and if it had no operations elsewhere other than in Hong Kong, it could only disclose at most one segment (or even nil segment) if its management was convinced that such fact was apparent to all investors. On the other hand, if the firm belonged to the Consolidated Enterprises industry, then it should be disclosing more segments than a uni-industry firm should if it was being truthful to the spirit of AG6.

In this section, I report the disclosure pattern of the sample firms by the nature of their industry. On the business analysis front, the mean business segments by Turnover (including those firms with zero disclosure) are shown in Exhibit 4.13a:

Exhibit 4.13a: Mean of Business Analysis Segments by Turnover

Industry	Year						6-year average
	1995	1996	1997	1998	1999	2000	
Industrials	0.90	2.01	2.22	2.43	2.44	2.48	2.09
Consol. Ent.	1.47	2.80	3.00	3.00	3.13	2.75	2.73
Properties	1.38	2.71	2.91	2.94	3.05	2.49	2.62
Hotels	1.18	2.67	2.83	3.00	3.23	2.86	2.65
Utilities	1.17	1.00	1.43	1.43	1.43	N/A	*1.29
Others	1.60	2.80	2.00	2.38	2.50	3.25	2.37
N/A Firms	1.38	2.61	2.47	2.08	1.91	2.29	2.15
All Industries Average	1.23	2.45	2.62	2.68	2.73	2.58	2.41
<i>N</i>	450	513	579	598	596	287	3023

*5-year only. Sample data for Year 2000 not yet available in SEQUENCER.

The all-firms, 6-year average is 2.41 segments which seems very low. Even those Consolidated Enterprises which are supposedly operating in most varied principal

activities by nature, the 6-year average is only 2.73 business segments. Such low level of disclosure, in fact, is biased by the presence of zero disclosure firms in the sample frame.

However, if those firms with zero disclosure are excluded, the pattern for those firms which disclosed one or more business segments by Turnover is shown in Exhibit 4.13b:

Exhibit 4.13b: Mean of Business Analysis Segments by Turnover for firms $BS_{n \geq 1}$

Industry	Year						6-year average
	1995	1996	1997	1998	1999	2000	
Industrials	3.06	3.43	3.51	3.53	3.36	3.33	3.41
Consol. Ent.	3.95	3.70	3.76	3.74	3.79	3.52	3.74
Properties	3.72	4.34	4.30	4.14	4.08	4.25	4.16
Hotels	4.33	3.56	3.40	3.55	23.50	3.33	3.53
Utilities	3.50	3.50	3.33	3.33	3.33	N/A	*3.38
Others	2.67	3.50	3.20	3.17	3.13	4.33	3.28
N/A Firms	2.75	2.94	2.80	2.83	2.89	3.44	2.92
All Industries Average	3.56	3.67	3.68	3.64	3.60	3.53	3.63
<i>N</i>	<i>155</i>	<i>342</i>	<i>413</i>	<i>440</i>	<i>452</i>	<i>210</i>	<i>2012</i>

*5-year only. Sample data for Year 2000 not yet available in SEQUENCER.

For those firms which disclosed one or more business segments, the trend is that they disclosed a mean 3.63 business segments. The mean segments reached a peak in Year 1997 (3.68 segments) but started to decline after then and the pattern looks like an inverted 'U'.

Among the various types of industries, Properties firms disclosed the most segments by Turnover. They disclosed 4.16 segments on average over the sampling period, well above Consolidated Enterprises and Hotels. Compared with the latter two industries in which firms should have more clearly identifiable business segments, Properties firms did not seem to be too "protective" in revealing their principal business activities.

On the geographical dimension, the sample firms' preference in disclosing their segmental information is more varied. Among the entire 3090 firm-years samples, over 55.1% of them disclosed geographical segments by Turnover by Source, followed by another 37.3% disclosed by Profit-by-Turnover by Source. The mean geographical segments, however, cluster around 2.47 for the period 1995 to 2000. Unlike its counterpart on the Business Analysis dimension, the level of disclosure on geographical segments does not seem to change much even though the number of firms that disclosed segments geographically is increasing steadily year by year.

Exhibit 4.14a: Mean of Geographical Analysis Segments by Turnover by Source

Industry	Year						6-year average
	1995	1996	1997	1998	1999	2000	
Industrials	1.69	3.60	3.49	3.52	3.60	3.58	3.27
Consol. Ent.	1.48	2.90	2.66	2.70	2.71	2.58	2.53
Properties	0.86	1.32	1.26	1.27	1.48	1.18	1.24
Hotels	2.18	2.33	2.33	2.00	3.00	1.14	2.25
Utilities	0.33	0.29	0.00	0.00	0.00	N/A	*0.12
Others	0.40	1.20	1.38	1.38	1.60	3.25	1.48
N/A Firms	1.75	2.35	1.97	1.61	1.59	2.36	1.85
All Industries Average	1.43	2.76	2.60	2.57	2.66	2.67	2.47
<i>N</i>	414	472	535	553	550	259	2783

*5-year only. Sample data for Year 2000 not yet available in SEQUENCER.

Industrials show the highest 6-year average disclosed geographical segment (3.27) whereas Utilities firms refrained from disclosing any geographical segments since 1997 onwards.

When firms with zero geographical segments disclosure were excluded from the sample, the pattern of disclosure of the remaining firms is shown in Exhibit 4.14b:

Exhibit 4.14b: Mean of Geographical Analysis Segments by Turnover by Source for firms $GS_{n \geq 1}$

Industry	Year						6-year average
	1995	1996	1997	1998	1999	2000	
Industrials	4.24	4.60	4.49	4.70	4.62	4.59	4.57
Consol. Ent.	3.98	3.82	3.74	3.79	3.68	3.55	3.75
Properties	3.23	3.05	3.10	3.42	3.32	3.36	3.23
Hotels	4.80	4.00	4.67	5.20	4.88	2.67	4.50
Utilities	2.00	2.00	N/A	N/A	N/A	N/A	*2.00
Others	2.00	3.00	2.75	2.75	3.20	3.25	2.95
N/A Firms	7.00	3.64	3.61	3.52	3.71	3.71	3.71
All Industries Average	4.01	4.04	3.98	4.12	4.05	3.95	4.03
<i>N</i>	147	323	349	345	362	175	1701

*2-year only. Nil sample data for Year 1997 to 2000 in SEQUENCER.

The 6-year average geographical segment is 4.03, much higher than the business segment average. Moreover, Hotels firms disclosed almost as many geographical segments as Industrials firms. This is an interesting finding in the sense that, should firms decide to disclose their segments, they seemed to disclose more geographical segments than business segments.

To answer my Research Question 1 (page 22), I find that most listed firms in Hong Kong did disclose segments, either by Business Analysis or by Geographical Analysis (see Exhibit 4.9a and 4.10a on disclosure firm-years vs. non-disclosure firm-years). For those firms that disclosed segmental information, they preferred to disclose segments by Turnover on the business dimension, and segments by Turnover by Source on the

geographical dimension. However, once the firms decided to disclose, they seemed to disclose more segments on the geographical dimension than on business dimension. One possible explanation is that firms in Hong Kong regarded geographical disclosure “safer” than business disclosure; that even though the turnover sources were disclosed, firms would not be facing as keen competition from competitors as when the principal business activities were disclosed.

To conclude, my empirical findings clearly indicate that more and more Hong Kong listed firms disclosed segments over the years. However, the *degree* of segmental disclosure – as expressed in terms of the mean segments disclosed either by business or geographical dimensions – did not show a marked increase over the years. This may be attributable to the accounting guideline **AG6** prevailing at the time, as **AG6** was commonly regarded as less compulsory than an Accounting Statement.

CHAPTER 5: Measurement of Voluntary Segmental Disclosure Level, Determination of Independent Variables, and Hypotheses Development

In this chapter, I discuss how to measure segmental disclosure, how to construct the derived variables and determine the independent variables, and present an overview of my hypotheses development. This chapter addresses my Research Question 2 (page 3) which is recapped here:

Research Question 2:

What are the factors that explain the difference in segmental disclosure for listed companies in Hong Kong? Are the factors the same as prescribed by accounting researchers in other advanced economies?

5.1 Introduction

Investors find segment data useful in improving the predictability of earnings forecasts (**Collins 1976, Baldwin 1984**) and reducing systematic risk (**Simonds and Collins 1978, Collins and Simonds 1979**). The data are associated with significant stock price reactions for first time disclosure of segment information (**Swaminathan 1991**) and a decrease in divergence of analysts' earnings forecasts (**Greenstein and Sami 1994**). Measurement of segment data can be taken along several dimensions: the *level* of disclosure (**Lang and Lundholm 1993, Botosan 1997, and Healy, Hutton, and Palepu 1999**), the *frequency* of segment disclosure (**Botosan and Harris 2000**), the *fineness* of

segment disclosure (**Hussain 1997, Herrmann and Thomas 2000**), and the *consistency* of segment information with other disclosures (**Street, Nichols, and Gray 2000**).

5.2 Measurement of Voluntary Segmental Disclosure and Determination of Derived Variables

One measurement of the level of disclosure about segment data is by quantity: the count of the total number of segments that is disclosed in financial reports. This measurement can be objectively assessed and it does not give undue weights to the classifications of segments (e.g. segments by *line-of-business*, by *geographical areas*, by *segment assets*, or by *segment profits*). Further derived forms of measurement can be built upon this horizontal summation of number of segments by assigning different weightings to different classifications. In my study, I employ both the horizontal summation of the segments disclosed (SumSeg) and the Total Maximum Number of Disclosed Segments (TMDS) derived from the disclosure by each firm, for each year, as the basic measurements of the management's decision on voluntary disclosure. In the latter part of my analysis, I will assign different weights to business segments to form a derived variable (WgBA), and to geographical segments for another variable (WgGA) according to their respective relative frequencies as observed in the annual reports.

Another derived variable is the average monthly returns of the company's stock. Prior research findings have linked the improved, voluntary, disclosures of a firm with its capital market valuation. Research findings show that enhanced disclosure increases liquidity and reduces the cost of equity capital (**Diamond and Verrecchia 1991; Frankel, McNichols, and Wilson 1995; Welker 1995**). More disclosure to investors

lessens their need for private information—which is costly to acquire—and will hence reduce the information asymmetries between managers and stakeholders of the firm, thus leading to lower transaction costs for the firm's stock. When a firm is committed to increased disclosure, the uncertainty surrounding the firm's stock price is reduced, thereby lowering the cost of equity capital (King, Pownall, and Waymire 1990). Consequently, the stock of such firms should be favoured by most investors, and thus it should yield a higher return than the norm of other firms in that same industry within the same year.

5.3 Summation of Segments (SumSeg)

In Chapter 4, I report the frequencies of business segments and geographical segments of the sample firms separately as two subsets to reflect the level of segmental disclosure. It indicates how detailed the firms might have disclosed their segments according to their principal business activities or the geographical markets. In this section, I discuss two different approaches to summarize those subsets of disclosed segments to arrive at two metrics that can be used as independent variables for my further hypotheses testing:

- (a) the horizontal summation of all segments disclosed across all dimensions—be they business, geographical, or assets in nature—into one single metric (**SumSeg**); and
- (b) the total maximum number of disclosed segments as disclosed within each category (**TMDS**).

SumSeg is the horizontal summation of the segments a firm disclosed along all dimensions and across all categories. Take China Motion Telecom International Ltd as

an example. From year 1966 to 2000, the company disclosed its business segments and geographical segments respectively as shown in Exhibits 5.1a and 5.1b:

Exhibit 5.1a: China Motion Telecom International Ltd: Segments disclosed – Business Dimension

Business dimension	1996	1997	1998	1999	2000
Segments by turnover	7	6	7	8	11
Segments by profit before tax	8	8	9	10	13
Segments by net assets	0	0	0	12	13
Total Business Segments	15	14	16	30	37

Exhibit 5.1b: China Motion Telecom International Ltd.: Segments disclosed -- Geographical Dimension

Geographical dimension	1996	1997	1998	1999	2000
Segments by turnover by source	2	2	2	3	3
Segments by profit-before-tax by source	3	4	4	5	5
Segments by net assets	0	0	0	3	3
Total Geographical Segments	5	6	6	11	11

Exhibit 5.2: China Motion Telecom International Ltd: Segments disclosed – Summation of Segments

	1996	1997	1998	1999	2000
Total Business Segments	15	14	16	30	37
Total Geographical Segments	5	6	6	11	11
Summation of Segments (SumSeg)	20	20	22	41	48

Exhibit 5.2 shows the summation of segments (SumSeg) disclosed in both Exhibits 5.1a and 5.1b. The SumSeg is the aggregate of the two totals of disclosed segments on the business dimension and the geographical dimension. Because it is not weighted by any scaler, SumSeg is an unadjusted measure of the total number of segments disclosed by the company.

5.4 Total of Maximum Number of Disclosed Segments (TMDS)

The other alternative to treat the disclosed segments is to look at them from the *informativeness* perspective and screen out the duplicated ones. First, I count the number of disclosed segments of each firm for each category. For firms that disclosed further business segments such as Profit-before-Tax, or by Net Assets, I take whichever is *higher* as the number of segments within that category.

This treatment may not differentiate the firms that disclosed only segments by Turnover from firms that disclosed segments by *both* Turnover *and* Profit-before-Tax along the same dimension. But it has an advantage that the maximum total number of segments per dimension is to be confined to 10, if the firm strictly followed the 10% disclosure threshold guideline. However, if firms did not follow that 10% rule strictly and if they disclosed segments for less than 10% of Total Turnover, they will stand out as disclosing more segments voluntarily. For example, in 1996, China Motion Telecom International Ltd. disclosed 11 segments by Turnover, 13 segments by Profit-before-Tax, and yet

another 13 segments by Net Assets (Exhibit 5.3a) on the business dimension. However, its degree of disclosure on the geographical dimension is much lower (Exhibit 5.3b):

**Exhibit 5.3a: China Motion Telecom International Ltd: Segments disclosed—
Business Dimension**

Business dimension	1996	1997	1998	1999	2000
Segments by turnover	7	6	7	8	11
Segments by profit before tax	8	8	9	10	13
Segments by net assets	0	0	0	12	13
<i>Maximum no. of disclosed segments</i>	<i>8</i>	<i>8</i>	<i>9</i>	<i>12</i>	<i>13</i>

**Exhibit 5.3b: China Motion Telecom International Ltd: Segments disclosed—
Geographical Dimension**

Geographical dimension	1996	1997	1998	1999	2000
Segments by turnover by source	2	2	2	3	3
Segments by profit-before-tax by source	3	4	4	5	5
Segments by net assets	0	0	0	3	3
<i>Maximum no. of disclosed segments</i>	<i>3</i>	<i>4</i>	<i>4</i>	<i>5</i>	<i>5</i>

Since the business segments and geographical segments are along *different* dimensions, I add up the *maximum* numbers of segments in each category to arrive at the **Total Maximum Number of Disclosed Segments (TMDS)** for that particular firm, for that particular year, as shown in Exhibit 5.4:

Exhibit 5.4: China Motion Telecom International Ltd: Segments disclosed—Total Maximum Number of Disclosed Segments

	1996	1997	1998	1999	2000
Max. number of disclosed segments – Business dimension	8	8	9	12	13
Max. number of disclosed segments – Geographical dimension	3	4	4	5	5
Total Max. no. of Disclosed Segments (TMDS)	11	12	13	17	18

In other words, TMDS is the aggregate of the highest numbers of segments disclosed on the two dimensions, *without* weighting. This measure, TMDS, is preferred to the previous summation of all the segments (SumSeg) because the latter may run the risk of grossing up unnecessarily the number of segments irrespective of where the segments appear. I take this measure as a proxy of the firm's extent of total voluntary disclosure.

5.5 Hypotheses Development for Research Question 2

Firm size can be one major factor that determines the level of disclosure. When firms are large, they have more human and capital resources, hence more opportunities, to engage in various potentially profitable businesses or markets which are beyond the capabilities of small firms. Moreover, large firms have more flexibility than do small firms in deploying assets into various activities to yield the maximum aggregate returns for their shareholders by flexing their market power. At the same time, the shareholders of large firms would have higher expectations about the accountability of the management, and of the operating results of the various activities the management participates in.

Shareholders in large firms would demand more disclosure and more in-depth information on various segments. At the least, large firms should have more human resources to compile those reports on the segmental results. Therefore, my hypothesis one (H1) is follows:

H1: Larger firms will disclose more segments.

Here, firm size is measured by 2 metrics: Total Assets (TOTASSET) and Total Market Capitalization (MARKCAP) of the firm. The 'Total Assets' represents the accounting value of the firm size whilst the 'Total Market Capitalization' represents the market valuation of the firm size at its fiscal year-end. In my regression analysis, I use the natural log of total assets LNTOTAST as my independent variable.

Firms that have higher Debt/Equity ratios may face higher pressures from the debt-holders to disclose more about their business activities in order to alleviate the agency problem. This reasoning is based on the information asymmetry school of economics (Jensen and Meckling 1976). A high D/E ratio (e.g. ≥ 1.0) indicates that the debt-holders' stake in the firm is higher than that of the equity-holders. It follows that the debt-owners would demand more disclosure on the lines of business their lendings are put to use, and consequently more pressure on the manager to disclose more segmental information. Hence, my second hypothesis (H2) is:

H2: Firms that have higher leverage will disclose more segments.

The more diversified the firm's business is, the more their shareholders would expect to know about the performance of each individual business segment. Once the manager discloses the kinds of business that the firm has operations in, investors will expect the manager to let them know how the firm performs in each kind of business because each industry has its own peculiar risks and characteristics that are not common to others. Some basic information such as turnover, profit, or assets in use for each industry or major segment will be of interest to the investors. However, such segmental results may *not* appear in a form of a quantitative, segment report but may be disclosed in a qualitative, descriptive manner in other sections of the financial reports (e.g. Chairman's report). Regardless the differences in disclosure format, the need for segmental disclosure of individual industry or segment performance, and the need for a consistency in the classification of industries or major segments in the Annual Reports, remains unaltered. As such, my third hypothesis (H3) is:

H3: Firms that are involved in more business industries as represented by the count of SIC codes (SicCount) will disclose more segments.

A firm will refrain from reporting separately operations that earn different rates of return (Hayes and Lundholm 1996). Hayes and Lundholm find that under severe competition, a firm's value is highest when it discloses that all segments have similar results. In so doing, the firm avoids adverse selection in the capital market, so much so that information is disclosed for standard-compliance purposes and yet the rival firms would learn very little.

Firms are not so likely to disclose their business segment operations in *less* competitive industries (Harris 1998). She finds that with multi-segment firms, managers do not reveal operations in *less* competitive industries (as indicated by above-average rates of return) even though in single-segment firms, managers do partially reveal the industries' higher rate of return. She also finds that, as the firm's internal heterogeneity in earnings persistence increases, the probability of segment disclosure decreases. In other words, if the managers believe that the abnormal earnings in the firm's segment will persist, the managers may maximize shareholder value by *not* reporting operations in that segment.

In Hong Kong where population density is high and information flow is free and quick, disclosure of potentially useful information to competitors is a major concern to most enterprises. Firms like to cling to their profitable sources of income without alerting their competitors. It follows that if the firm is enjoying an above-average rate of return from a segment, it is not likely to divulge that source (unless it is a mandatory requirement). Its managers will attempt to conceal information about that segment. My fourth hypothesis (H4) is therefore:

H4: Firms that enjoy above-average accounting returns will disclose less segments.

To test this hypothesis, I calculate the average Industry Return on Net Assets (IndRONA%) for each industry for every year from 1995 to 2000. I then measure the excess (or shortfall) of each firm's Return on Net Assets (RONA%) against that industry average for that same year. The difference is the RONAdiff that will be used as an independent variable in testing the hypothesis.

Based on two streams of research by **Amihud and Mendelson (1986)** and **Diamond and Verrechia (1991)** which provide theoretical support, **Botosan (1997)** concludes that there is an inverse relationship between the level of disclosure and cost of equity capital. In her study, she documents a significant lowering of cost of equity capital (by 28 basis points) for those firms that increase their voluntary disclosure level (by 1 unit). Given such lower cost-of-capital benefits, the firm should stand to gain if it responds to the investors' demand for more information disclosure. In another study, **Botosan (2000)** finds that firms with the highest level of disclosure had a cost of equity capital that is 9 percentage-points lower than otherwise similar firms with a minimal level of disclosure.

An indicator of such increased demand for a firm's information is the change in the number of earnings estimates by the analysts following a firm over the years. When there is an increase in the number of estimates, there is an increased pressure for the firm to disclose more information, of which segmental information is widely considered useful, in its financial reports. In other words, if a firm is to become responsive to the investors' demand for more information, the management of the firm should act accordingly. Therefore, the increased number of analyst following (as a proxy to the increased level of investors' interest in a firm) should lead to an increased level of segmental information. Hence, my fifth hypothesis (H5) is:

H5: Firms that have more analysts following in a fiscal year (year t) will disclose more segments in the same fiscal year.

In my analysis, the number of analysts following the firm is proxied by the number of earnings estimates, made by the analysts without duplication, that are

obtained from the I/B/E/S ¹(June 2000) file. The number of estimates is observed within the period 6 months after the fiscal year end. Any duplicated earnings estimates made by the same analyst (verified by the same analyst code) are deleted. The number of segments disclosed in the annual report is regressed on the number of estimates observed in the same fiscal year.

In the same vein, if a firm is to respond actively to the analysts' demand for more information, the firm should also attend to the accuracy of the analysts' forecast in no lesser manner. A big earnings forecast error reflects a surprise on the expected earnings of the firm, which would cause the firm's stock price to fluctuate and might invite disciplinary actions from the Hong Kong Stock Exchange or might lead to an unwarranted or costly investigation by the Securities and Futures Commission (SFC).

However, the firm can neither foresee how accurate the analysts' earnings forecasts are, nor can it release the exact earnings per share to the individual analysts concerned prior to the annual results disclosure date. A forecast error on the part of the analysts is inevitable. Since a big earnings forecast error is undesirable to the management as well, the firm will try to minimize it by providing more information to investors at large, but can only do so *ex post*. It follows that the larger the forecast error in a firm's earnings in year $t-1$, the more segments the firm will disclose in year t , if the firm is to act responsively to the demand of external investors. Hence my sixth hypothesis (H6) is:

H6: Firms that experienced a larger analyst's forecast error in the previous fiscal year will disclose more segments in the current fiscal year.

¹ The author gratefully acknowledges the contribution of Thomson Financial for providing earnings per share forecast data, available through the Institutional Brokers Estimate System. This data has been provided as part of a broad academic program to encourage expectations research.

The forecast error is expressed as the absolute value of the percentage of forecast error deflated by the actual earnings per share:

$$FE_{jt} = |(F_{jt} - A_{jt}) / A_{jt}|$$

where FE_{jt} = percentage forecast error of firm j for year t ,
 F_{jt} = mean forecast earnings per share of firm j for year t ,
 A_{jt} = actual earnings per share of firm j for year t .

For analysis purposes, any forecast error exceeding 100% is truncated at 100%. This practice is in line with previous similar research on determining the analysts' forecast errors (Allen, Cho, and Jung 1999). The forecast error in year $t-1$ (FE_{ErrPrev}) will be used as the explanatory variable for the regression model.

Similar to the Debt/Equity Ratio, an indicator of external stakeholders' interest in the firm is the percentage of institutional block share holding. The information of material block share holding (i.e. > 10% of total number of shares) is required to be disclosed in the annual reports. By screening out the management- related block share holding from this information, I obtain the institutional block share holding percentage. The higher the institutional holding percentage is, the more pressure will be put on the management to divulge more operational information about the firm.² Hence my seventh hypothesis (H7) is:

H7: Firms that have a higher percentage of institutional block share holdings will disclose more segments.

The above-mentioned Hypotheses 1-7 are related to my Research Question 2 (page 58). They attempt to find out what factors are affecting voluntary segmental disclosure. A summary of the various hypotheses and variables specification is presented in Exhibit 5.5 on the next page.

Exhibit 5.5**Hypotheses and Variables Specification Summary**

Hypothesis	Dependent Variable(s)	Independent Variable(s)	Expected Sign of relationship
1. The larger the firm size, the more segments disclosed.	a) The weighted no. of segments reported under business dimension (WgBA); b) The weighted no. of segments reported under geographical dimension(WgGA); c) Composite Index of Segmental Disclosure [ComISD = (a)W1+(b)W2]	a) Natural log of the firm's total assets (LnTotAst).	Positive
2. The higher the firm's leverage, the more segments disclosed.	Same as above.	Debt/Equity ratio (D/E-ratio).	Positive
3. The more industries the firm is involved in, the more segments disclosed.	Same as above.	The count of SIC codes (SicCount) as reported in SEQUENCER.	Positive
4. More profitable firms disclose less segments.	Same as above.	Return on Net Assets excess or shortfall against the industry average for year <i>t</i> (RONAdiff).	Negative
5. Firms that have more analysts following in year <i>t</i> disclose more segments in current year <i>t</i> .	Same as above.	The no. of non-duplicated earnings estimates (NumEst) in the I/B/E/S database within a 5-month period after a firm's fiscal year end to proxy for the	Positive

² Thanks to another MPhil student Ms. Suwina Cheng who collected the data by hand for the Hong Kong firms from 1993 to 1998. This was later supplemented for 1999. Data for 2000 are not yet available.

6. Firms that have larger earnings forecast errors in year (<i>t</i> -1) will disclose more segments in year <i>t</i> .	Same as above	<p>number of analysts following the firm. Forecast error at year <i>t</i>-1 (FE_{errPre}) where the forecast error (FE) is measured by:</p> $FE_{jt} = (A_{jt} - F_{jt}) / A_{jt} $ <p>where A_{jt} = actual earnings of firm <i>j</i> for year <i>t</i>. F_{jt} = Mean forecast earnings of firm <i>j</i> for year <i>t</i>.</p>	Positive
7. Firms that have higher percentage of institutional block holding will disclose more segments.	Same as above	<p>Block share holding % (BlockOwn) disclosed in the annual reports measured by the percentage(>10%) held by non-company related parties.</p>	Positive

CHAPTER 6: Results Based on SumSeg

This chapter reports the findings of the segment disclosure practices of the listed firms in my sample. Descriptive statistics of the aggregate summation of segments (SumSeg) will first be discussed, followed by the different groupings of segments by business and by geographical analysis dimensions.

6.1 Descriptive Statistics of SumSeg

During the 1995-2000 sampling period, SEQUENCER captured the number of segments as disclosed by the firms in their annual reports. The segments were classified under business analysis and geographical analysis dimensions. A firm discloses its segments on the business analysis dimension, or geographical analysis dimension, or on both. The summation of the total number of segments (SumSeg) is a horizontal summation of all the disclosed segments captured in SEQUENCER.

Therefore, if on each dimension a firm segregated its reported segments further by Turnover and by Profit-before-tax, it would appear as reporting 4 times as many segments as another which reported business segments by Turnover alone. Because of this grossing effect of reported segments, the overall mean of SumSeg reported is 10.69 segments for the entire sample despite the most frequent case is that the firms did not disclose any segment, i.e. mode = 0 (see Chapter 4). The frequency distribution of the overall SumSeg is shown in Exhibit 6.1 but the descriptive statistics of each industry are shown in subsections of 6.1(i) to 6.1(vii) Section 6.2.

Exhibit 6.1: Frequency distribution of Summation of segments, all firms, 1995-2000

No. of Segments	Frequency	Percent	Valid Percent	Cumulative Percent
0	616	19.9	19.9	19.9
1	8	.3	.3	20.2
2	71	2.3	2.3	22.5
3	67	2.2	2.2	24.7
4	100	3.2	3.2	27.9
5	137	4.4	4.4	32.3
6	120	3.9	3.9	36.2
7	125	4.0	4.0	40.3
8	122	3.9	3.9	44.2
9	106	3.4	3.4	47.6
10	139	4.5	4.5	52.1
11	101	3.3	3.3	55.4
12	138	4.5	4.5	59.9
13	109	3.5	3.5	63.4
14	141	4.6	4.6	68.0
15	94	3.0	3.0	71.0
16	125	4.0	4.0	75.0
17	71	2.3	2.3	77.3
18	128	4.1	4.1	81.5
19	57	1.8	1.8	83.3
20	137	4.4	4.4	87.8
21	41	1.3	1.3	89.1
22	99	3.2	3.2	92.3
23	28	.9	.9	93.2
24	76	2.5	2.5	95.7
25	20	.6	.6	96.3
26	48	1.6	1.6	97.9
27	11	.4	.4	98.2
28	16	.5	.5	98.7
29	7	.2	.2	99.0
30	6	.2	.2	99.2
31	1	.0	.0	99.2
32	10	.3	.3	99.5
33	1	.0	.0	99.5
34	2	.1	.1	99.6
35	1	.0	.0	99.6
36	2	.1	.1	99.7
37	2	.1	.1	99.8
38	1	.0	.0	99.8
39	2	.1	.1	99.9
40	1	.0	.0	99.9
41	2	.1	.1	100.0
49	1	.0	.0	100.0
Total	3090	100.0	100.0	

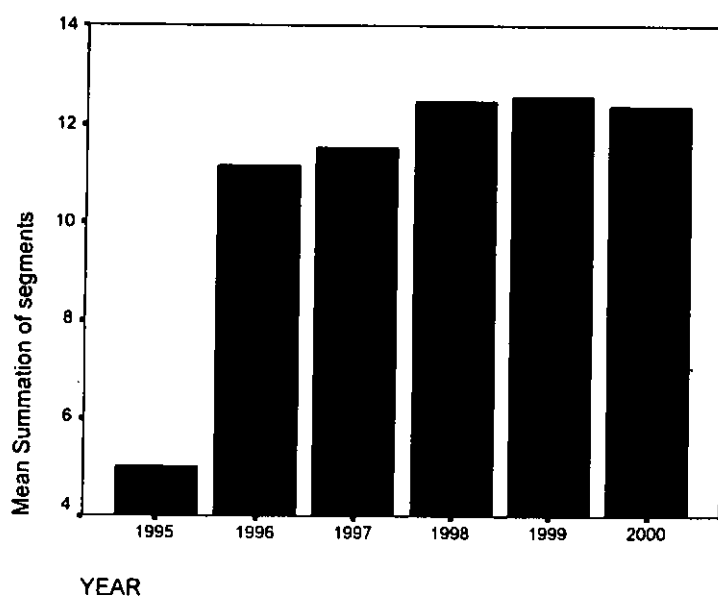
6.1(i): Industrials, 1995-2000

The mean SumSeg in 1995 is 5.04, which is significantly less than the mean reported segments in later years. The standard deviation for that year, however, is not that different from those of the following years' samples of Industrial companies. In fact, there is a marked increase in the mean SumSeg reported from 1996 (more than double) onwards. The increase in mean reported segments is not due to the increase in sample size (N) but is a growth in the segment disclosure practices.

Exhibit 6.2a) Summation of segments: Mean and median for Industrial firms by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	176	0	25	.00	5.04	7.47
1996	199	0	35	11.00	11.18	7.65
1997	220	0	34	12.00	11.54	7.84
1998	221	0	32	13.00	12.46	7.56
1999	222	0	38	12.00	12.59	7.84
2000	120	0	30	13.00	12.39	8.03
Total	1158	0	38	11.00	10.96	8.12

Exhibit 6.2b) Mean summation of segments of Industrials firms, 1995-2000



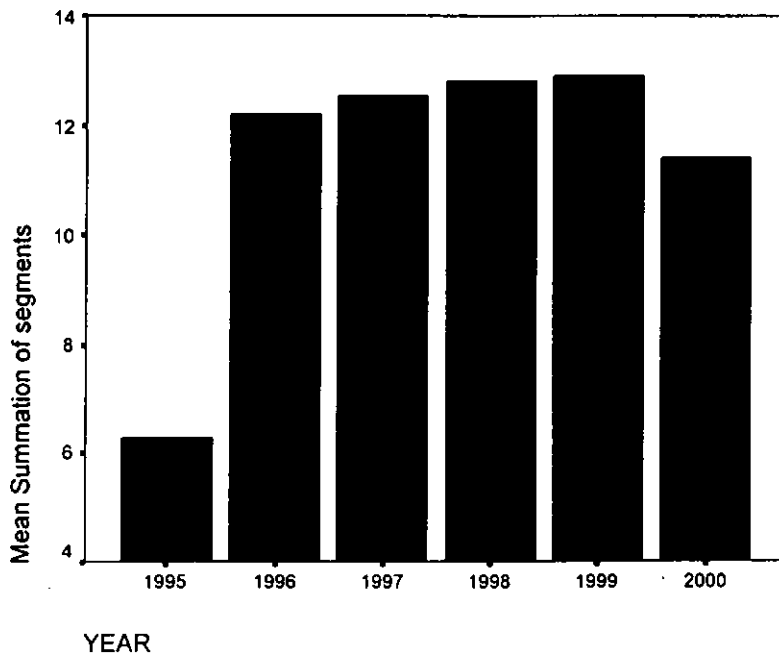
6.1(ii): Consolidated Enterprises, 1995-2000

The mean SumSeg for the 5-year average is 11.52 reported segments. Again, the mean reported segments in year 1995 is significantly small (6.27) compared to the same of the following years and yet the standard deviation (8.19) is in line with other years.

Exhibit 6.3a) Summation of segments: Mean and median for Consolidated Enterprises by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	165	0	34	.00	6.27	8.19
1996	184	0	37	12.00	12.21	7.67
1997	203	0	36	12.00	12.55	8.12
1998	203	0	32	12.00	12.81	8.05
1999	199	0	41	12.00	12.90	7.70
2000	114	0	49	11.00	11.42	8.70
Total	1068	0	49	11.00	11.52	8.33

Exhibit 6.3b) Mean summation of segments of Consolidated Enterprises, 1995-2000



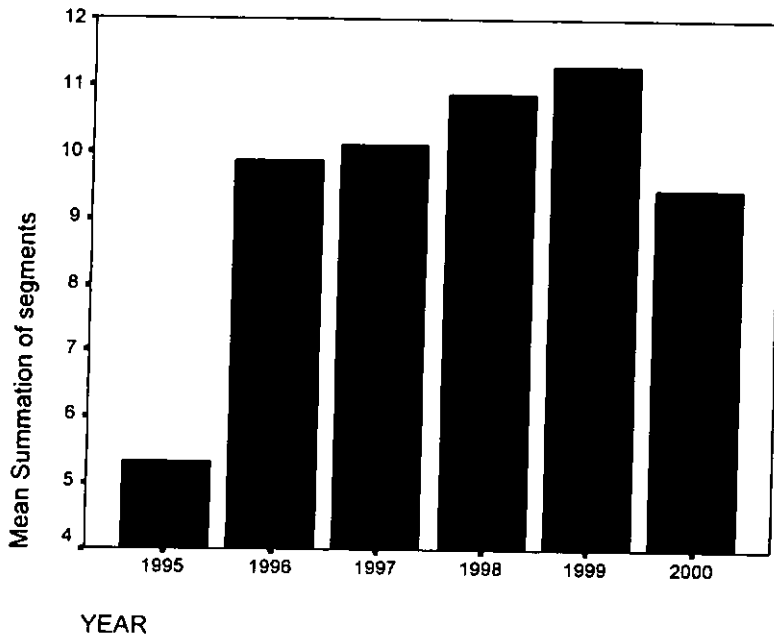
6.1(iii): Properties, 1995-2000

The mean Sumseg for Properties firms in Year 1995 is 5.31. Again, there is a stark increase in the mean from 1996 onwards which is not attributed to the increase in sample size. The standard deviation of the summation of reported segments remains stable at 7 over the 5-year period.

Exhibit 6.4a) Summation of segments: Mean and median for Properties firms by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	86	0	24	.00	5.31	7.23
1996	93	0	27	9.00	9.87	7.54
1997	99	0	28	9.00	10.13	7.40
1998	100	0	29	10.00	10.88	7.04
1999	95	0	32	11.00	11.31	7.05
2000	45	0	26	9.00	9.44	7.59
Total	518	0	32	9.00	9.58	7.52

Exhibit 6.4b) Mean summation of segments of Properties firms, 1995-2000



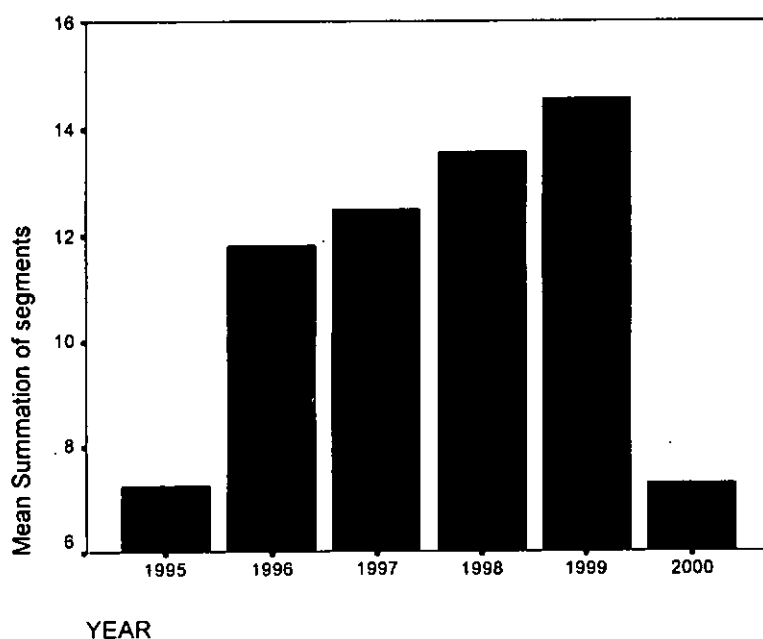
6.1(iv): Hotels, 1995-2000

The Hotel industry shows a steady growth in the mean reported segment over the period from 1995 to 1999. In 1995, the mean reported segment is 7.27. By 1999, the mean has increased to twice as much to reach 14.54. At the same time, the standard deviations of the disclosure over the years are getting smaller and smaller. It seems that an industry norm on segment reporting is coming to shape and that each company in the Hotel Industry is adopting similar disclosure practice.

Exhibit 6.5a) Summation of segments: Mean and median for Hotels by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	11	0	40	.00	7.27	12.28
1996	12	0	39	9.50	11.83	10.28
1997	12	0	37	11.50	12.50	9.94
1998	13	0	39	12.00	13.54	10.77
1999	13	0	41	10.00	14.54	11.33
2000	10	0	22	7.50	7.30	7.62
Total	71	0	41	10.00	11.41	10.54

Exhibit 6.5b) Mean summation of segments of Hotels, 1995-2000



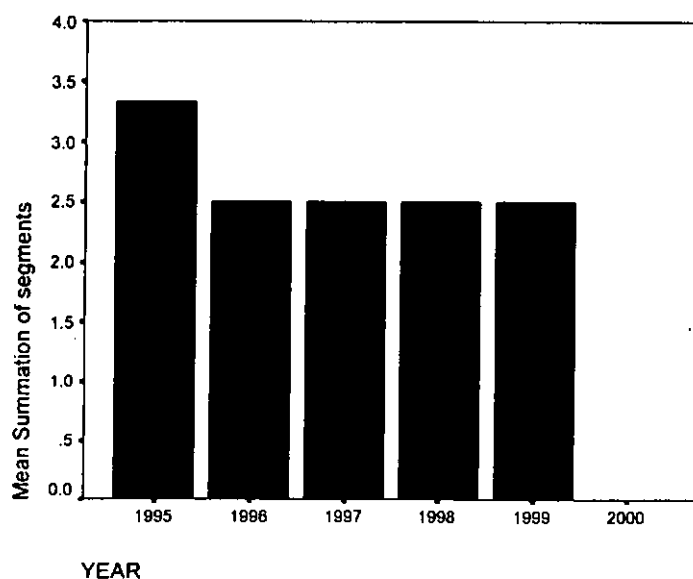
6.1(v): Utilities, 1995-2000

The sample size of Utilities firms in Hong Kong in SEQUENCER was small (N= 6 in 1995; N=5 in 2000). In Year 2000, SEQUENCER did not capture any segmental data during the sample collection period in 2000. As such, the mean summation of segments is zero. The inclusion of two firms' data in the 1996 sample (CLP Holdings and Kowloon Motor Bus Co.), both of which did not give any segment information, has lowered the mean of reported segments for the Utilities industry from 3.33 to 2.50 in that year. Subsequent decrease in the segments disclosed by The Cross Harbour Tunnel Co. Ltd was made up for by the slight increase in segments disclosed by other utilities firms, thus the mean number of segment disclosed for the Utilities industry remains stable thereafter (see summary table and chart of summation segment means next page).

Exhibit 6.6a) Summation of segments: Mean and median for Utilities firms by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	6	0	10	.00	3.33	5.16
1996	8	0	10	.00	2.50	4.63
1997	8	0	10	.00	2.50	3.93
1998	8	0	10	.00	2.50	3.93
1999	8	0	10	.00	2.50	3.93
2000	5	0	0	.00	.00	.00
Total	43	0	10	.00	2.33	3.91

Exhibit 6.6b) Mean summation of segments of Utilities, 1995-2000



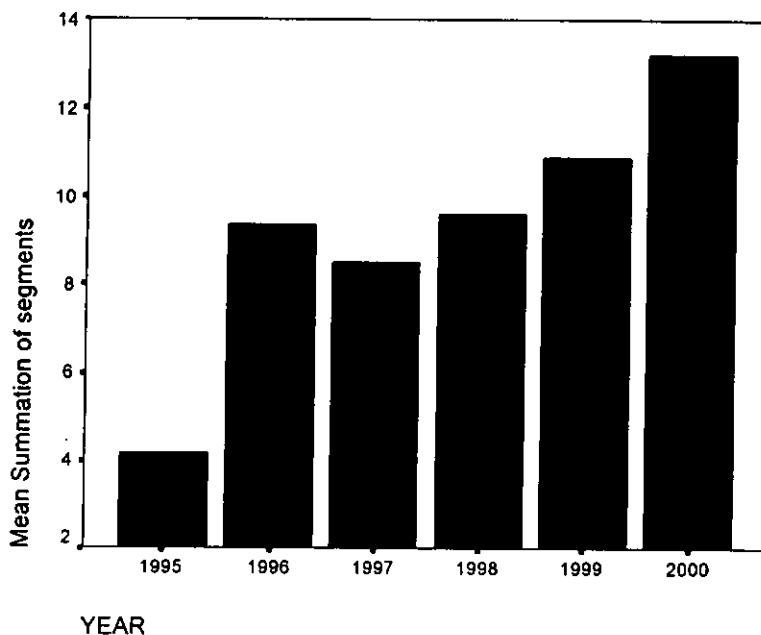
6.1(vi): Others, 1995-2000

The Others category shows the most varied pattern in terms of segmental disclosure. Like most other categories, firms in Others tend to disclose zero segments. However, there is a clear trend that the firms are increasing their mean reported segments over the period from 1995 to 1999 (and to 2000 as well, subject to the sample data availability). On the other hand, the standard deviations are fluctuating year after year over the same period, indicating a lack of consensus of how much disclosure is widely acceptable to all firms in this industry.

Exhibit 6.7a) Summation of segments: Mean and median for Others firms by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	5	0	10	2.00	4.20	4.92
1996	5	0	20	10.00	9.40	8.11
1997	8	0	26	6.00	8.50	9.15
1998	8	0	28	8.00	9.63	8.78
1999	10	0	26	11.00	10.90	9.36
2000	5	0	26	14.00	13.20	12.05
Total	41	0	28	9.00	9.46	8.79

Exhibit 6.7b) Mean summation of segments of Others, 1995-2000



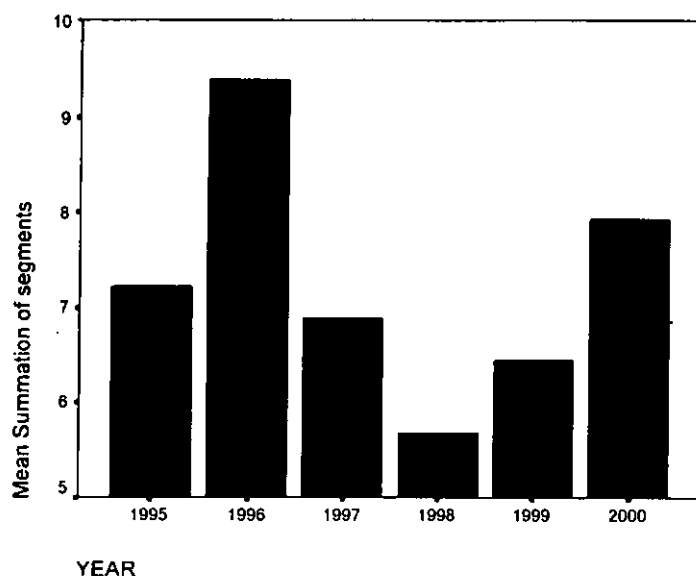
6.1(vii): N/A Firms, 1995-2000

Because of the lack of homogeneity for N/A firms, the mean reported segments and the standard deviations do not reveal any significant, consistent, patterns over the sampling period 1995-2000. However, the median reported segments falls within the region of 4.5 to 6.5; and that in the last two years or so, the median reported segments has stabilized at 5.0. Hence, more than 50% of the N/A firms disclosed more than 5.0 segments, and about the same number of N/A firms disclosed less than that threshold. The standard deviation has no discernible trend, reflecting an absence of consensus on the practice of segmental disclosure amongst these N/A companies.

Exhibit 6.8a) Summation of segments: Mean and median for N/A firms by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	9	0	27	.00	7.22	10.45
1996	18	0	27	6.50	9.39	7.75
1997	34	0	25	6.00	6.88	5.43
1998	50	0	27	4.50	5.68	5.99
1999	54	0	29	5.00	6.44	6.28
2000	26	0	28	5.00	7.92	7.78
Total	191	0	29	5.00	6.84	6.67

Exhibit 6.8b) Mean summation of segments of N/A firms, 1995-2000



It can be seen from the above descriptive statistics that Hong Kong listed firms did not disclose a great number of segments, and that a large proportion of them did not disclose any segment at all. However, the results indicate the trend was on the rise and that firms had been disclosing more segments voluntarily even before the new segment reporting standard had become effective. Among the firms of various industries, firms belonging to Consolidated Enterprises reported the highest mean SumSeg (11.52) whereas firms belonging to Utilities reported the lowest mean SumSeg (2.33). While this may be attributed to the difference in the nature of industries, it is interesting to note that firms in the Hotels industry reported the second highest number of segments (11.41), which is even higher than the Industrials (10.96) and is significantly higher than the Properties firms (9.58). Managers of firms in the Hotels industry seemed to be more willing to disclose their activities in more segments than their counterparts in the Industrial industry.

Exhibit 6.9:

Mean Summation of Segments disclosed by industry, by year, from 1995-2000

Industry	Year						6-year average
	1995	1996	1997	1998	1999	2000	
Industrials	5.04	11.18	11.54	12.46	12.59	12.39	10.96
Con.Entp.	6.27	12.21	12.55	12.81	12.90	11.42	11.52
Properties	5.31	9.87	10.13	10.88	11.31	9.44	9.58
Hotels	7.27	11.83	12.50	13.54	14.54	7.30	11.41
Utilities	3.33	2.50	2.50	2.50	2.50	0.00	2.33
Others	4.20	9.40	8.50	9.63	10.90	13.20	9.46
N/A firms	7.22	9.39	6.88	5.68	6.44	7.92	6.84

The mean number of disclosed segments tends to increase across almost all industries except Utilities from 1996 onwards (see Exhibit 6.9 above). This may be attributed to

two reasons: most of the firms' data in SEQUENCER cover the period from 1995 to 1999, and relatively few firms provide data in the years 1991-1994. The second possible reason is that firms did genuinely provide more segments than before. I have randomly checked with the annual reports of several consolidated enterprises and noticed that some companies provided more detailed segment information from 1996 onwards (e.g. Perfectech, when the contribution by geographical area was first released). Since firms at that time reported only the contemporary years' segmental operating results, they did not provide the back data for 1995 or previous years for comparison purposes.

My second treatment in describing the firms' disclosure patterns is to report the segments separately: by *business* dimension, and by *geographical* dimension; and then attach respective weights to them to arrive at a composite index to measure the overall extent of segment disclosure. This will be discussed in detail in Section 6.2.

6.2 Weighted Numbers of Segment Disclosure

The firms in my sample grouped their reported segments mainly on two dimensions: business analysis dimension and geographical analysis dimension. There were several ways a firm opted to disclose along each dimension. For instance, under the business dimension, a firm might disclose its segments in three possible ways:

- a) Turnover,
- b) Profit before tax,
- c) Total assets or net assets.

However, not all firms report segments in ALL three ways. Some firms opted to report segments by turnover only; some by turnover and by profit before tax; and some firms (8 in total) opted to report segments in all three: turnover, profit before tax, and net assets. Among the 3,090 firm-entries, the frequencies of such reporting pattern are as follows:

Exhibit 6.10:
Frequency and relative frequency of business segments reporting: non-zero entries

Business Analysis	Frequency	Relative frequency
Turnover	2012	0.525
Profit before tax	1795	0.469
Net assets	22	0.006
Total non-zero entries	3829	1.000

The relative frequencies act as the respective weights which are to be applied to the number of segments that the firm disclosed in each way. They are then added up to form the weighted number of segments disclosed under the business dimension. For example, in Year 1999, China Motion Telecom disclosed 8 segments by turnover, 10 segments by profit before tax, and 11 segments by net assets (see Appendix I). The weighted number of business analysis segments (WgBA) that China Motion Telecom for 1999 is: $8(0.525) + 10(0.469) + 11(0.006) = 8.956$ business segments.

Similarly, for the disclosed segments along the geographical dimension, my sample data had frequencies as follows:

Exhibit 6.11:

Frequency and relative frequency of geographical segments reporting: non-zero entries

Geographical Analysis	Frequency	Relative frequency
Turnover by source	1701	0.536
Turnover by market	204	0.064
Profit before tax by source	1154	0.364
Profit before tax by market	95	0.030
Total Assets	4	0.001
Net Assets	15	0.005
Total non-zero entries	3173	1.000

Using China Motion Telecom as an example again, in Year 1999 on the geographical dimension, the company disclosed 3 segments by turnover by source, 5 segments by profit before tax by source, and 3 segments by net assets. The weighted number of geographical segments (WgGA) is: $3(0.536) + 5(0.364) + 3(0.005) = 3.443$ segments (see Appendix I for details).

Finally, to see how much significance the firms had placed on business analysis and geographical analysis, I calculate their relative frequencies in my sample in similar manner:

Exhibit 6.12:

Frequency and relative frequency of dimensional segments reporting: by business analysis and geographical analysis

Non-zero entries	Frequency	Relative frequency
Business analysis	3829	0.55
Geographical analysis	3173	0.45
Total	7002	1.00

This relative frequency will enable me to assign respective weights to a firm's disclosure along both business analysis and geographical analysis dimensions. With this, I can come up with a single, weighted, index measurement of the level of segmental disclosure of that firm. For example, to give a single index of the level of segmental disclosure of China Motion Telecom, I weigh each dimensional segment number with the relative frequency: $8.956(0.55) + 3.443(0.45) = 6.475$ to reflect the relative importance of both the business analysis and geographical analysis dimensions.

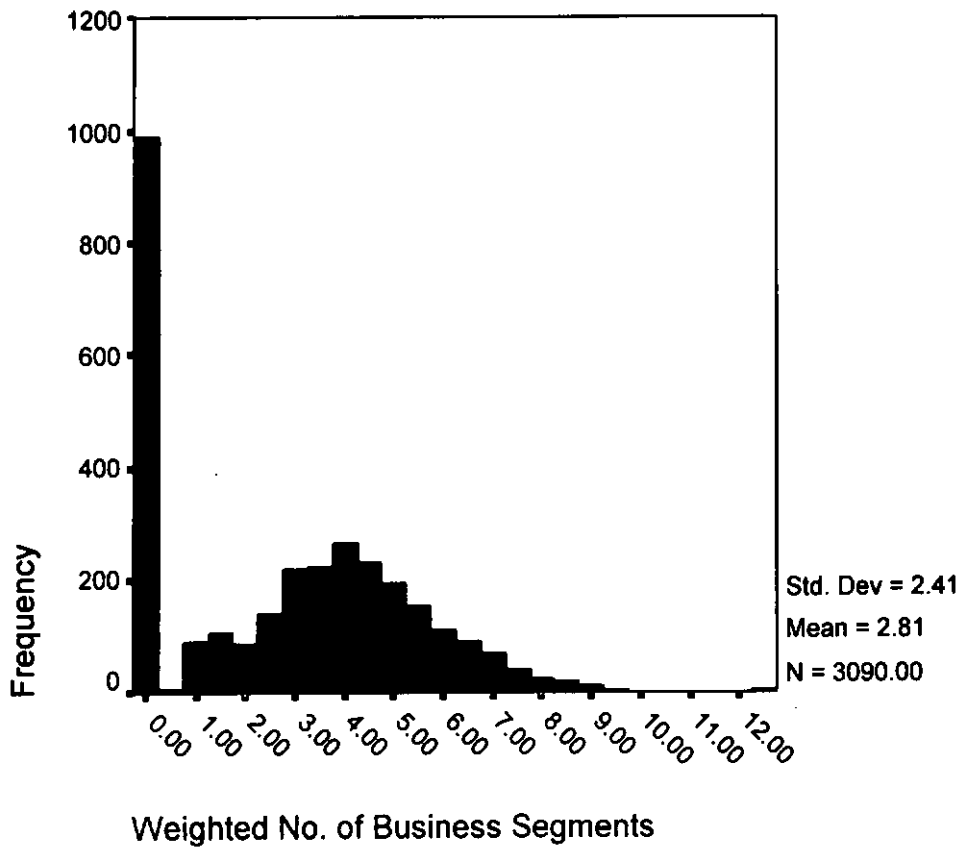
6.3 Composite Index of Segmental Disclosure (ComISD)

The derived outcome above, 6.475, is a composite index of segmental disclosure (**ComISD**)—as first stated in Exhibit 5.5 on page 69—that incorporates the firm's decisions of voluntary disclosure about its all-round segment details in all dimensions. Compared to China Motion Telecom's summation of segments (SumSeg), which is a horizontal summation of all the numbers of segments disclosed (i.e. $8+10+11+3+5+3 = 40$), the composite index (ComISD) drastically deflates the number of segments but provides a tighter measurement of the firm's disclosure on its segments.

The histograms of the weighted number of business analysis segments (WgBA), the weighted number of geographical segments (WgGA), and the composite index of segmental disclosure (ComISD) are presented in Exhibits 6.13, 6.14, and 6.15 respectively.

Exhibit 6.13

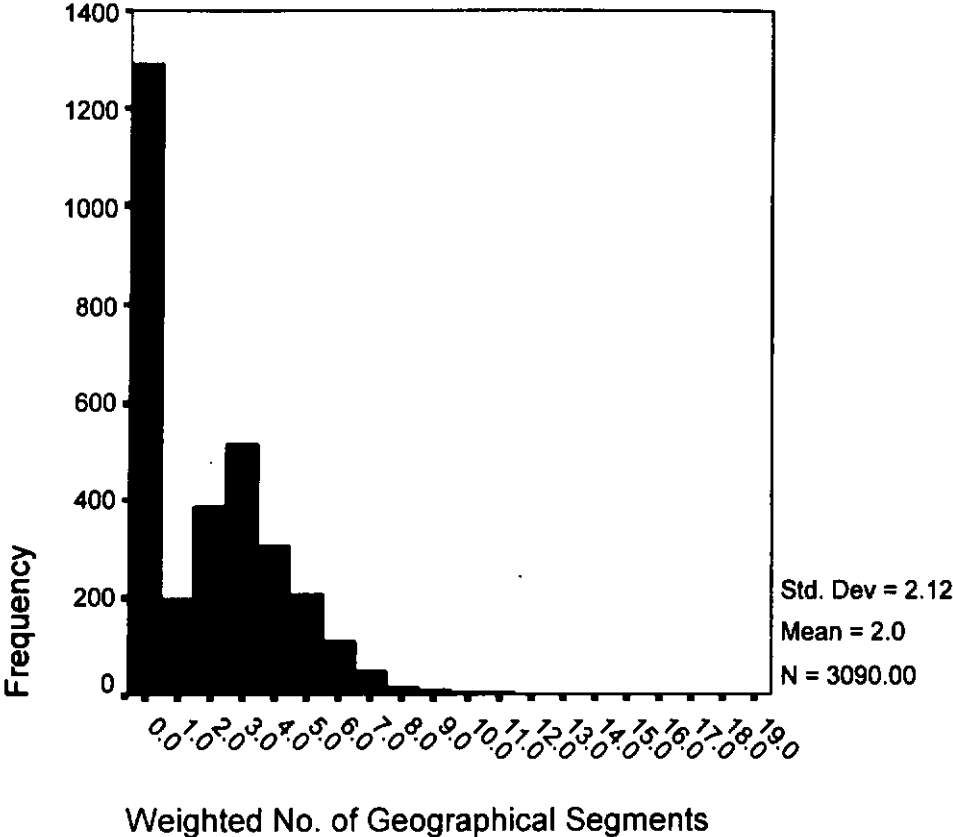
Histogram of the Weighted Number of Business Analysis Segments (WgBA)



	N	Minimum	Maximum	Mean	Std. Deviation
Weighted No. of Business Segments	3090	.00	12.34	2.806	2.413

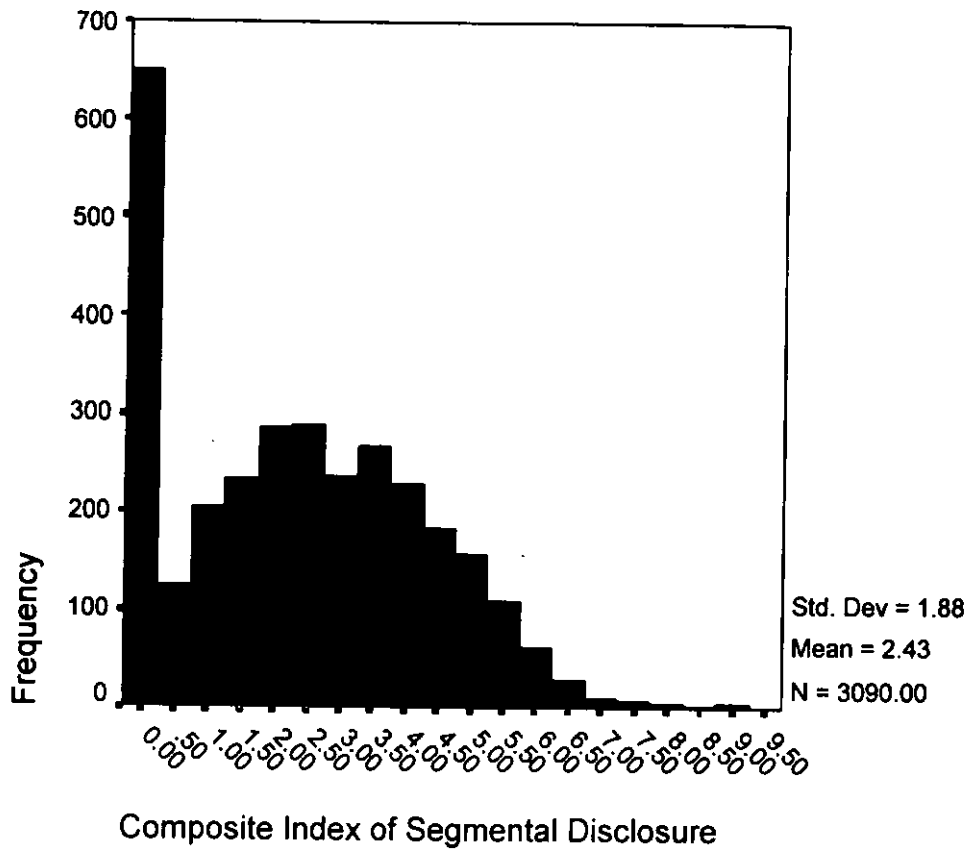
Exhibit 6.14

Histogram of the Weighted Number of Geographical Segments (WgGA)



	N	Minimum	Maximum	Mean	Std. Deviation
Weighted No. of Geographical Segments	3090	.000	19.296	1.968	2.119

Exhibit 6.15
Composite Index of Segmental Disclosure (ComISD)



	N	Minimum	Maximum	Mean	Std. Deviation
Composite Index of Segmental Disclosure	3090	.000	9.261	2.429	1.881

6.4 Research Question 2

My second research question is:

What are the factors that explain the difference in segmental disclosure for listed companies in Hong Kong? Are the factors the same as prescribed by the accounting researchers in other advanced economies?

This research question can be answered by testing the various hypotheses **H1** to **H7** as stated from page 63 to page 68 and are recapped here:

H1: Larger firms will disclose more segments.

[size being measured by the natural log of a firm's total assets (LnTotAst)]

H2: Firms that have higher leverage will disclose more segments.

[leverage being measure by the Debt/Equity ratio (D/E-ratio)]

H3: Firms that are involved in more business industries as represented by the count of SIC codes (SicCount) will disclose more segments.

[involvement is measured by the count of SIC codes (SicCount) in SEQUENCER]

H4: Firms that enjoy above-average accounting returns will disclose less segments.

[above-average returns is measured by the Return on Net Assets excess (RONAdiff) over the industry average (IndRONA%) in the same year]

H5: Firms that have more analysts following in a fiscal year (year t) will disclose more segments in the same fiscal year.

[the number of analysts following is indicated by the number of earning forecasts made by the analysts, without duplication, that are captured by I/B/E/S June 2000 database (NumEst)]

H6: Firms that experienced a larger analysts' forecast error in the previous fiscal year will disclose more segments in the current fiscal year.

[the forecast error of the year $t-1$ (FErrPrev) is used as the independent variable for regressing the dependent variable in year t ; the forecast error being defined as the absolute difference between mean forecast earnings and the actual earnings of firm j for year t , scaled by the actual earnings for that year]

H7: Firms that have a higher percentage of institutional block share holding will disclose more segments.

[the percentage is measured by the block share holding that is larger than 10% of the firm's share held by non-company related parties (BlockOwn) disclosed in the annual reports]

To test these hypotheses, I run three multiple regression models using respectively the weighted number of business analysis segments (WgBA), the weighted number of geographical segments (WgGA), and the composite index of segmental disclosure (ComISD). These derived metrics are developed in Sections 6.2 (page 82-83) and 6.3 (page 84) respectively as the dependent variables in the regression models.

The independent variables for each regression are the same: the natural log of total assets (LnTotAst); the debt/equity ratio (D/E-ratio); the count of SIC codes (SicCount); the difference between the return on net assets of a firm i in industry j for year t and the return on net assets of the same industry for the same year (RONAdiff); the number of earnings estimates that are captured in the I/B/E/S database one month prior to the release of the firm's operating results (NumEst); the mean absolute earnings forecast error of the firm in the previous year (FErrPre); and the block share holding percentage held by external investors (BlockOwn) as disclosed in the annual reports.

To control for industry effects, I also incorporate 6 industry dummy variables (IndDV's) into my multiple regression models:

$$(1) \text{ WgBA} = \beta_1 + \beta_2 \text{ LnTotAst} + \beta_3 \text{ D/E-ratio} + \beta_4 \text{ SicCount} + \beta_5 \text{ RONAdiff} \\ + \beta_6 \text{ NumEst} + \beta_7 \text{ FErrPre} + \beta_8 \text{ BlockOwn} + \beta_9 \text{ IndDV2} + \beta_{10} \text{ IndDV3} \\ + \beta_{11} \text{ IndDV5} + \beta_{12} \text{ IndDV6} + \beta_{13} \text{ IndDV7} + \beta_{14} \text{ IndDV8}$$

$$(2) \text{ WgGA} = \beta_1 + \beta_2 \text{ LnTotAst} + \beta_3 \text{ D/E-ratio} + \beta_4 \text{ SicCount} + \beta_5 \text{ RONAdiff} \\ + \beta_6 \text{ NumEst} + \beta_7 \text{ FErrPre} + \beta_8 \text{ BlockOwn} + \beta_9 \text{ IndDV2} + \beta_{10} \text{ IndDV3} \\ + \beta_{11} \text{ IndDV5} + \beta_{12} \text{ IndDV6} + \beta_{13} \text{ IndDV7} + \beta_{14} \text{ IndDV8}$$

$$(3) \text{ ComISD} = \beta_1 + \beta_2 \text{ LnTotAst} + \beta_3 \text{ D/E-ratio} + \beta_4 \text{ SicCount} + \beta_5 \text{ RONAdiff} \\ + \beta_6 \text{ NumEst} + \beta_7 \text{ FErrPre} + \beta_8 \text{ BlockOwn} + \beta_9 \text{ IndDV2} + \beta_{10} \text{ IndDV3} \\ + \beta_{11} \text{ IndDV5} + \beta_{12} \text{ IndDV6} + \beta_{13} \text{ IndDV7} + \beta_{14} \text{ IndDV8}$$

where:

$$\text{IndDV}_k = \{1 = \text{Industry } k, 0 = \text{otherwise}\}$$

k runs from 2, 3, 5, 6, 7, to 8 to signify the different industry codes stated in SEQUENCER (Industry 4 denotes financial institutions which are excluded from my sample). The base dummy variable industry is Industry 1 (Industrials). IndDV2 is the dummy variable for Industry 2 (Consolidated enterprises); IndDV3 is for Industry 3 (Properties); IndDV5 is for Industry 5 (Hotels); IndDV6 is for Industry 6 (Utilities); IndDV7 is for Industry 7 (Others); and IndDV8 is for Industry 8 (N/A firms).

The results of the three regression models are shown in Tables 1-6 in the following pages.

In all 3 models, the Pearson correlation coefficients between the dependent variables and the explanatory variables are less than 0.8 (Table 1, 2, 3 refer). The correlation coefficients amongst all the explanatory variables are also less than 0.8. Therefore, multicollinearity does not seem to be a major problem in the models.

Table 1: Pearson Correlation Coefficients for Model 1: WgBA (N= 475)

Pearson Correlation	WgBA	LnTotAst	D/E-ratio	SicCount	RONAdiff	NumEst	FErPre	BlockOwn	Ind DV2	Ind DV3	Ind DV5	Ind DV6	Ind DV7	Ind DV8
WgBA	1.000													
LnTotAst	.246	1.000												
D/E-ratio	.046	-.106	1.000											
SicCount	.308	.348	-.020	1.000										
RONAdiff	.036	-.016	-.078	-.010	1.000									
NumEst	.027	.637	-.095	.222	.001	1.000								
FErPre	.114	-.168	.018	-.036	.126	-.346	1.000							
BlockOwn	-.061	.244	-.039	-.073	-.006	.112	.058	1.000						
Ind DV2	.128	-.128	-.034	.038	.402	.038	.025	-.091	1.000					
Ind DV3	.174	.503	-.058	.234	-.127	.305	-.012	.194	-.358	1.000				
Ind DV5	.007	.129	-.040	-.131	-.067	.050	-.034	.065	-.181	-.120	1.000			
Ind DV6	-.160	.117	-.037	-.076	-.062	.102	-.147	-.061	-.166	-.110	-.055	1.000		
Ind DV7	.041	-.018	-.010	.017	-.017	-.051	-.031	.042	-.048	-.032	-.016	-.015	1.000	
Ind DV8														1.000
WgBA	.000													
LnTotAst	.157	.010												
D/E-ratio	.000	.000	.331											
SicCount	.215	.363	.045	.417										
RONAdiff	.280	.000	.019	.000	.491									
NumEst	.006	.000	.344	.218	.003	.000								
FErPre	.093	.000	.197	.057	.447	.007	.105							
BlockOwn	.003	.003	.229	.205	.000	.207	.291	.023						
Ind DV2	.000	.000	.105	.000	.003	.000	.395	.000	.000					
Ind DV3	.437	.002	.191	.002	.074	.139	.233	.079	.000	.005				
Ind DV5	.000	.005	.212	.049	.088	.013	.001	.093	.000	.008	.114			
Ind DV6	.187	.350	.411	.354	.357	.135	.251	.181	.149	.246	.364	.375		
Ind DV7	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Ind DV8														

Sig. (1-tailed)

Table 2: Pearson Correlation Coefficients for Model 2: WgGA (N= 475)

Pearson Correlation	WgGA	LnTotAst	D/E-ratio	SicCount	RONAdiff	NumEst	FErrPre	BlockOwn	Ind DV2	Ind DV3	Ind DV5	Ind DV6	Ind DV7	Ind DV8
WgGA	1.000													
LnTotAst	-.062	1.000												
D/E-ratio	.133	-.106	1.000											
SicCount	.139	.348	-.020	1.000										
RONAdiff	.009	-.016	-.078	-.010	1.000									
NumEst	-.094	.637	-.095	.222	.001	1.000								
FErrPre	.073	-.168	.018	-.036	.126	-.346	1.000							
BlockOwn	-.099	.244	-.039	-.073	-.006	.112	.058	1.000						
Ind DV2	.150	-.128	-.034	.038	-.402	.038	.025	-.091	1.000					
Ind DV3	-.124	.503	-.058	.234	-.127	.305	-.012	.194	-.358	1.000				
Ind DV5	-.080	.129	-.040	-.131	-.067	.050	-.034	.065	-.181	-.120	1.000			
Ind DV6	-.229	.117	-.037	-.076	-.062	.102	-.147	-.061	-.166	-.110	-.055	1.000		
Ind DV7	-.014	-.018	-.010	.017	-.017	-.051	-.031	.042	-.048	-.032	-.016	-.015	1.000	
Ind DV8														1.000
Sig. (1-tailed)	WgGA	LnTotAst	D/E-ratio	SicCount	RONAdiff	NumEst	FErrPre	BlockOwn	Ind DV2	Ind DV3	Ind DV5	Ind DV6	Ind DV7	Ind DV8
WgGA	.087													
LnTotAst	.002	.010												
D/E-ratio	.001	.000	.331											
SicCount	.424	.363	.045	.417										
RONAdiff	.020	.000	.019	.000	.491									
NumEst	.055	.000	.344	.218	.003	.000								
FErrPre	.015	.000	.197	.057	.447	.007	.105							
BlockOwn	.001	.003	.229	.205	.000	.207	.291	.023						
Ind DV2	.004	.000	.105	.000	.003	.000	.395	.000	.000					
Ind DV3	.040	.002	.191	.002	.074	.139	.233	.079	.000	.005				
Ind DV5	.000	.005	.212	.049	.088	.013	.001	.093	.000	.008	.114			
Ind DV6	.384	.350	.411	.354	.357	.135	.251	.181	.149	.246	.364	.375		
Ind DV7	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Ind DV8														

Table 3: Pearson Correlation Coefficients for Model 3: ComISD (N= 475)

Pearson Correlation	ComISD	LnTotAst	D/E-ratio	SicCount	RONAdiff	NumEst	FErrPre	BlockOwn	Ind DV2	Ind DV3	Ind DV5	Ind DV6	Ind DV7	Ind DV8
ComISD	1.000													
LnTotAst	.155	1.000												
D/E-ratio	.108	-.106	1.000											
SicCount	.312	.348	-.020	1.000										
RONAdiff	.033	-.016	-.078	-.010	1.000									
NumEst	-.030	.637	-.095	.222	.001	1.000								
FErrPre	.128	-.168	.018	-.036	.126	-.346	1.000							
BlockOwn	-.101	.244	-.039	-.073	-.006	.112	.058	1.000						
Ind DV2	.180	-.128	-.034	.038	.402	.038	.025	-.091	1.000					
Ind DV3	.067	.503	-.058	.234	-.127	.305	-.012	.194	-.358	1.000				
Ind DV5	-.038	.129	-.040	-.131	-.067	.050	-.034	.065	-.181	-.120	1.000			
Ind DV6	-.247	.117	-.037	-.076	-.062	.102	-.147	-.061	-.166	-.110	-.055	1.000		
Ind DV7	.024	-.018	-.010	.017	-.017	-.051	-.031	.042	-.048	-.032	-.016	-.015	1.000	
Ind DV8														1.000
Sig. (1-tailed)	ComISD	ComISD												
LnTotAst	.000													
D/E-ratio	.009	.010												
SicCount	.000	.000	.331											
RONAdiff	.239	.363	.045	.417										
NumEst	.254	.000	.019	.000	.491									
FErrPre	.003	.000	.344	.218	.003	.000								
BlockOwn	.014	.000	.197	.057	.447	.007	.105							
Ind DV2	.000	.003	.229	.205	.000	.207	.291	.023						
Ind DV3	.074	.000	.105	.000	.003	.000	.395	.000	.000					
Ind DV5	.204	.002	.191	.002	.074	.139	.233	.079	.000	.005				
Ind DV6	.000	.005	.212	.049	.088	.013	.001	.093	.000	.008	.114			
Ind DV7	.301	.350	.411	.354	.357	.135	.251	.181	.149	.246	.364	.375		
Ind DV8	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

6.4.1 Empirical Analysis on Model 1: WgBA

Table 4 (page 95) provides the regression results on Model 1 where the relationship of the weighted number of business analysis segments (WgBA) and the explanatory variables is explored, after controlling for industry effect. Of the 7 key explanatory variables in the model, only the return on net assets difference (RONAdiff) is insignificant. The other 6 key explanatory variables are all significant at 5% significant level.

The sign of the number of estimates (NumEst) and the block ownership of shares (BlockOwn) are both negative. This indicates that, the more analysts the firm attracts to make earnings estimates, and the higher the percentage of block share ownership, the less the firm will disclose its weighted number of business segments. This seems to suggest that the purposes of more voluntary segmental disclosure are only partially fulfilled when other information channels to the investors are present to the management.

Comparing the 6 industry dummy variables against the base industry (Industry Code 1-- Industrials), firms under Industry Code 6 (IndDV6 --Utilities) seem to report fewer business segments than their Industrial counterparts. Firms in other industries are found to report more business segments although the industry dummy variable 5 (IndDV5-- Hotels) and dummy variable 7 (IndDV7-- Others) register a p-value 0.21 and 0.09 (>5% sig. level) respectively. Other industry dummy variables, except IndDV5 and IndDV7, are found to be significant.

Table 4
Regression Result : Model 1

$$\begin{aligned} \text{WgBA} = & \beta_1 + \beta_2 \text{LnTotAst} + \beta_3 \text{D/E-ratio} + \beta_4 \text{SicCount} + \beta_5 \text{RONAdiff} \\ & + \beta_6 \text{NumEst} + \beta_7 \text{FErrPre} + \beta_8 \text{BlockOwn} \\ & + \beta_9 \text{IndDV2} + \beta_{10} \text{IndDV3} + \beta_{11} \text{IndDV5} \\ & + \beta_{12} \text{IndDV6} + \beta_{13} \text{IndDV7} + \beta_{14} \text{IndDV8} \end{aligned}$$

	Coefficient	t-statistic	p-value ^a
Intercept	-10.874	-4.752	0.000
LnTotAst	0.582	5.194	0.000
D/E-ratio	0.001	1.689	0.049
SicCount	0.247	4.266	0.000
RONAdiff	0.000	-0.807	0.210
NumEst	-0.050	-3.712	0.000
FErrPre	0.007	2.239	0.013
BlockOwn	-1.321	-2.869	0.002
IndDV2	1.175	4.153	0.000
IndDV3	0.813	2.193	0.015
IndDV5	0.681	1.334	0.093
IndDV6	-1.239	-2.269	0.012
IndDV7	2.205	1.330	0.092
IndDV8	N.A.*	N.A.*	N.A.*

Adj. R² = 20.6%

Prob. > F = 0.000

^a One-tail test.

- WgBA is the weighted number of segments reported under business dimension. LnTotAst is the natural log of total assets. D/E-ratio is the debt/equity ratio. SicCount is the count of SIC codes of the firm as reported in SEQUENCER. RONAdiff is the excess or shortfall against the industry average return on net assets for year *t*. NumEst is the number of non-duplicated estimates in the I/B/E/S database within a 5-month period after a firm's fiscal year-end. FErrPre is the mean forecast error made in previous year (i.e. year *t* - 1). BlockOwn is the block share holding percentage held by external institutional investors.
- *The dummy variable IndDV8 has missing correlations with WgBA and thus is deleted from the regression model.

(source: SPSS\0221_wkfile4, Output 0221_RQ2.1b)

6.4.2 Empirical Analysis on Model 2: WgGA

Model 2 analyzes the relationship between the weighted number of segments reported under the geographical dimension (WgGA) and the other key explanatory variables, controlling for industry effect. The regression results are reported in Table 5 (page 97), which shows the adjusted R^2 of Model 2 is 11.5%, considerably less than that of Model 1 (20.6%). Moreover, there exist more explanatory variables with p-values higher than the 5% threshold (one-tail test): RONAdiff ($p = 0.138$), NumEst ($p = 0.073$), and FErrPre ($p = 0.229$). There are only three significant variables: LnTotAst ($p = 0.026$), D/E-ratio ($p = 0.006$), and SicCount ($p = 0.006$).

Like Model 1, NumEst and BlockOwn in Model 2 continue to have negative signs which goes against the hypothesis. However, NumEst is significant at the 7.3% level and BlockOwn is significant at 5.0% level using the one-tail test. This suggests that the higher the block holding of shares a firm has, the less it reports the weighted number of geographical segments. Again, it seems to suggest that when another information channel is available, the managers will reduce their voluntary segmental disclosure to the stakeholders.

In terms of differences in industries, only those firms under Industry Code 2 (Consolidated Enterprises) reported more geographical segments than the firms in base industry (Industrials). All other industries reported less weighted number of geographical segments, although the p-value for IndDV7 (Others) is not significant ($p = 0.305$).

Table 5
Regression Result: Model 2

$$\begin{aligned} \text{WgGA} = & \beta_1 + \beta_2 \text{LnTotAst} + \beta_3 \text{D/E-ratio} + \beta_4 \text{SicCount} + \beta_5 \text{RONAdiff} \\ & + \beta_6 \text{NumEst} + \beta_7 \text{FErrPre} + \beta_8 \text{BlockOwn} \\ & + \beta_9 \text{IndDV2} + \beta_{10} \text{IndDV3} + \beta_{11} \text{IndDV5} \\ & + \beta_{12} \text{IndDV6} + \beta_{13} \text{IndDV7} + \beta_{14} \text{IndDV8} \end{aligned}$$

	Coefficient	t-statistic	p-value ^a
Intercept	-2.206	-4.752	0.146
LnTotAst	0.199	5.194	0.026
D/E-ratio	0.001	1.689	0.006
SicCount	0.134	4.266	0.006
RONAdiff	0.000	-0.807	0.138
NumEst	-0.018	-3.712	0.073
FErrPre	0.002	2.239	0.229
BlockOwn	-0.692	-2.869	0.050
IndDV2	0.244	4.153	0.172
IndDV3	-1.136	2.193	0.000
IndDV5	-0.956	1.334	0.020
IndDV6	-2.560	-2.269	0.000
IndDV7	-0.771	1.330	0.305
IndDV8	N.A.*	N.A.*	N.A.*

Adj. R² = 11.5%

Prob. > F = 0.000

^a One-tail test.

- WgGA is the weighted number of segments reported under geographical dimension. LnTotAst is the natural log of total assets. D/E-ratio is the debt/equity ratio. SicCount is the count of SIC codes of the firm as reported in SEQUENCER. RONAdiff is the excess or shortfall against the industry average return on net assets for year *t*. NumEst is the number of non duplicated estimates in the I/B/E/S database within a 5-month period after a firm's fiscal year-end. FErrPre is the mean forecast error made in previous year (i.e. year *t* - 1). BlockOwn is the block share holding percentage held by external institutional investors.
- *The dummy variable IndDV8 has missing correlations with WgGA and thus is deleted from the regression model.

(source: SPSS\0221_wkfile4, Output 0221_RQ2.1b)

6.4.3 Empirical Analysis on Model 3: ComISD

Table 6 (page 99) reports the regression result of the regression Model 3. It has the highest adjusted R^2 (= 22.9%) among the three regression models. Except for RONAdiff, which has a p-value of 0.103, all other key explanatory variables i.e. LnTotAst, D/E-ratio, SicCount, NumEst, and BlockOwn are significant at the 5% level (one-tail test).

Similar to Model 1 and Model 2, NumEst and BlockOwn in Model 3 continue to have opposite signs with the dependent variable ComISD, which is consistent as ComISD is a composite index of segmental disclosure being weighted by the relative frequencies of WgBA and WgGA. The greater the number of analysts following the firm, and the larger the proportion a firm's shares are held by institutional investors, the smaller is the ComISD of the firm. This seems to suggest that the firm's management opts for lesser voluntary segmental disclosure to the general public when other kinds of information channels to the market, such as interviews with the analysts and the regular meetings with institutional shareholders, are available to the firm.

In terms of industry differences, firms in Industry Code 2 (Consolidated Enterprises) are found to report a significant and larger composite segmental disclosure index than firms in the base industry (Industrials). Firms in Industry Code 6 (Utilities) are found to be reporting a smaller composite index that is also significantly different from Industrial firms.

Table 6
Regression Result: Model 3

$$\begin{aligned} \text{ComISD} = & \beta_1 + \beta_2 \text{LnTotAst} + \beta_3 \text{D/E-ratio} + \beta_4 \text{SicCount} + \beta_5 \text{RONAdiff} \\ & + \beta_6 \text{NumEst} + \beta_7 \text{FErrPre} + \beta_8 \text{BlockOwn} \\ & + \beta_9 \text{IndDV2} + \beta_{10} \text{IndDV3} + \beta_{11} \text{IndDV5} \\ & + \beta_{12} \text{IndDV6} + \beta_{13} \text{IndDV7} + \beta_{14} \text{IndDV8} \end{aligned}$$

	Coefficient	t-statistic	p-value ^a
Intercept	-6.974	-4.318	0.000
LnTotAst	0.410	5.182	0.000
D/E-ratio	0.001	2.788	0.003
SicCount	0.196	4.801	0.000
RONAdiff	0.000	-1.264	0.103
NumEst	-0.036	-3.741	0.000
FErrPre	0.005	2.177	0.015
BlockOwn	-1.038	-3.195	0.000
IndDV2	0.756	3.787	0.000
IndDV3	-0.064	-0.246	0.403
IndDV5	-0.056	-0.154	0.439
IndDV6	-1.834	-4.758	0.000
IndDV7	-0.866	0.740	0.230
IndDV8	N.A.*	N.A.*	N.A.*

Adj. R² = 22.9%
Prob. > F = 0.000

^a One-tail test.

- ComISD is the composite index of segmental disclosure. LnTotAst is the natural log of total assets. D/E-ratio is the debt/equity ratio. SicCount is the count of SIC codes of the firm as reported in SEQUENCER. RONAdiff is the excess or shortfall against the industry average return on net assets for year *t*. NumEst is the number of non-duplicated estimates in the I/B/E/S database within a 5-month period after a firm's fiscal year-end. FErrPre is the mean forecast error made in the previous year (i.e. year *t* - 1). BlockOwn is the block share holding percentage held by external institutional investors.
- *The dummy variable IndDV8 has missing correlations with ComISD and thus is deleted from the regression model.

(source: SPSS\0221_wkfile4, Output 0221_RQ2.1b)

CHAPTER 7: Sensitivity Analysis – Results Based on TMDS

As noted previously in Chapter 5, Section 5.4 (page 60), I process the raw data of disclosed segments with an alternative treatment from the *informativeness* perspective. Instead of horizontally summing up all the firms' disclosed segments across all categories along the business and geographical dimensions, I observe the maximum number of segments under the business analysis dimension (**MaxBaSeg**) and under the geographical dimension (**MaxGaSeg**). Then I add them up to arrive at a new, singular metric: the Total Maximum Number of Disclosed Segments (**TMDS**). This chapter reports the findings of the sample firms based on TMDS.

7.1 Descriptive Statistics of MaxBaSeg, MaxGaSeg, and TMDS

Exhibit 7.1a: Frequency distribution chart of MaxBaSeg

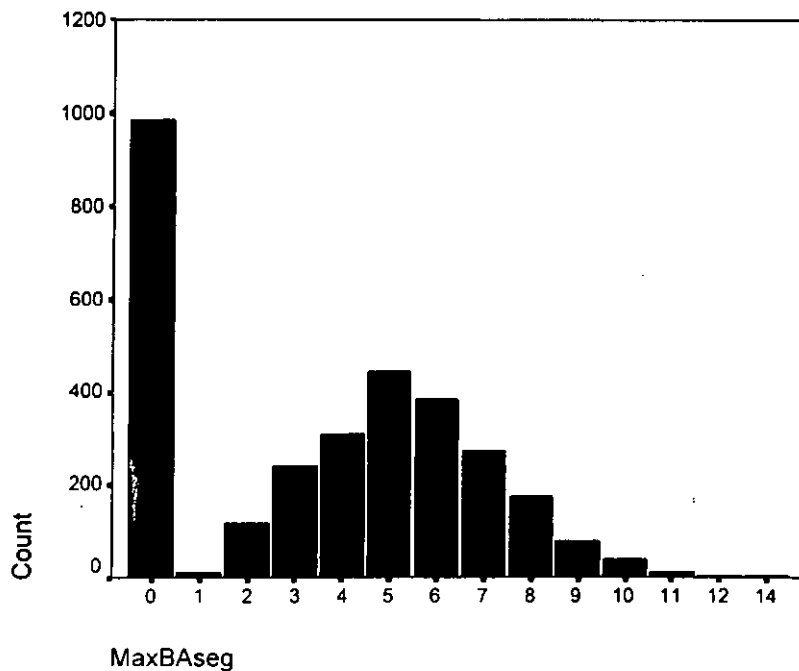


Exhibit 7.1b : Frequency distribution chart of MaxGaSeg

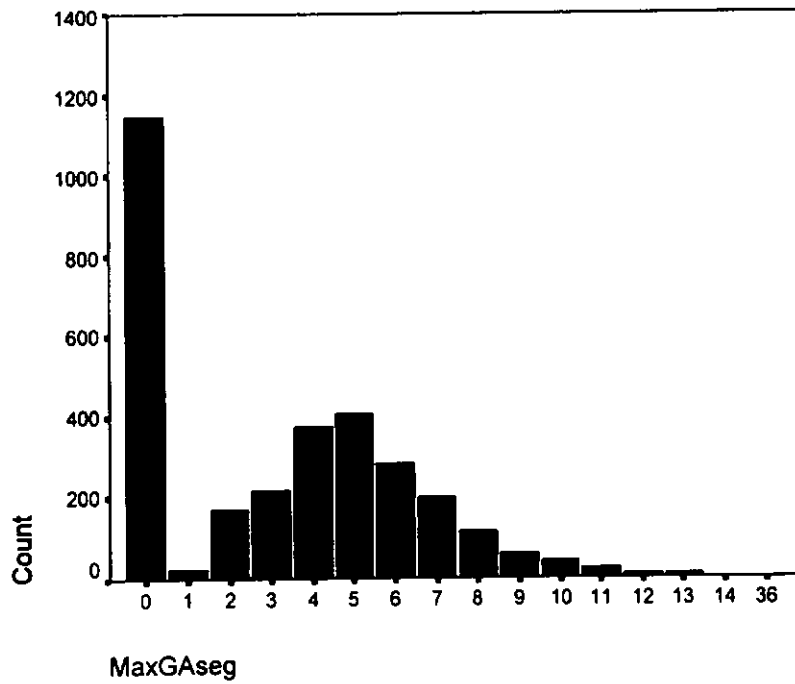
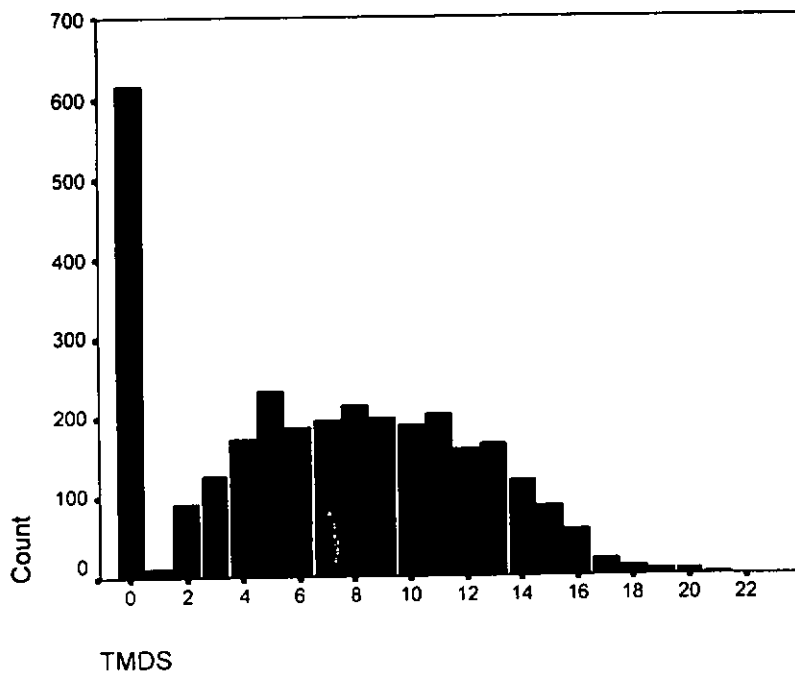


Exhibit 7.1c: Frequency distribution chart of TMDS, all industries, 1995-2000



**Exhibit 7.2a: Descriptive Statistics for MaxBAseg, MaxGAseg, and TMDS
(N= 3090)**

	Mean	Median	Mode	Minimum	Maximum
MaxBAseg	3.70	4.00	0	0	14
MaxGAseg	3.27	3.00	0	0	36
TMDS	6.97	7.00	0	0	38

**Exhibit 7.2b: Frequency distribution of Total Maximum Number of Disclosed
Segments (TMDS), all firms, 1995-2000**

TMDS	Frequency	Percent	Cumulative Percent
0	616	19.9	19.9
1	11	.4	20.3
2	93	3.0	23.3
3	127	4.1	27.4
4	175	5.7	33.1
5	235	7.6	40.7
6	188	6.1	46.8
7	196	6.3	53.1
8	215	7.0	60.1
9	199	6.4	66.5
10	189	6.1	72.6
11	203	6.6	79.2
12	159	5.1	84.3
13	166	5.4	89.7
14	120	3.9	93.6
15	87	2.8	96.4
16	59	1.9	98.3
17	22	.7	99.0
18	12	.4	99.4
19	7	.2	99.6
20	6	.2	99.8
21	3	.1	99.9
22	1	.0	100.0
38	1	.0	100.0
Total	3090	100.0	

Using the total maximum number of disclosed segments (TMDS) as the key metric of measurement, I conduct similar tests to address my research questions as a sensitivity analysis. The descriptive statistics of MaxBaSeg, MaxGaSeg, and TMDS are shown in Exhibits 7.1a, b, c and 7.2a respectively. The frequency distribution of TMDS is shown in Exhibit 7.2b (page 102). The descriptive statistics of TMDS by firms of individual industry categories, from 1995 to 2000, are shown in the following subsections:

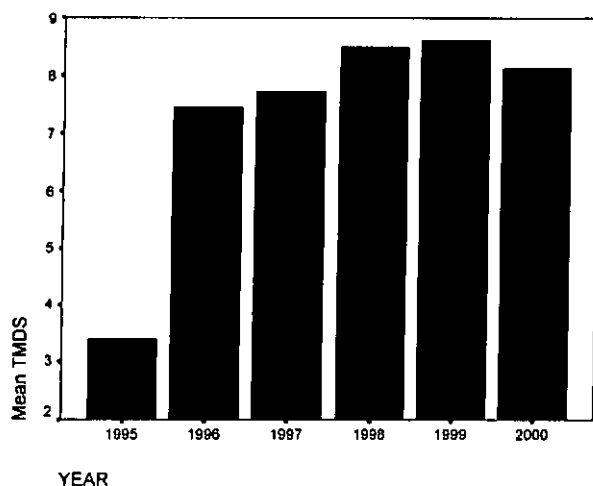
7.1(i): Industrials, 1995-2000

The mean TMDS shows an increasing trend (Exhibit 7.3a) and is very similar to the SumSeg (Exhibit 6.2b on page 73). A significant increase in Mean TMDS is noted in 1996, consistent with the notion that the increase is due to a growth in the segment disclosure practices rather than an increase in sample size.

Exhibit 7.3a) Mean and median TMDS for Industrial firms, by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	176	0	16	.00	3.42	4.83
1996	199	0	20	8.00	7.44	4.60
1997	220	0	20	8.00	7.72	4.83
1998	221	0	19	9.00	8.49	4.55
1999	222	0	38	9.00	8.59	4.97
2000	120	0	17	9.00	8.13	5.01
Total	1158	0	38	8.00	7.37	5.08

Exhibit 7.3b) Mean TMDS of Industrial firms, 1995-2000



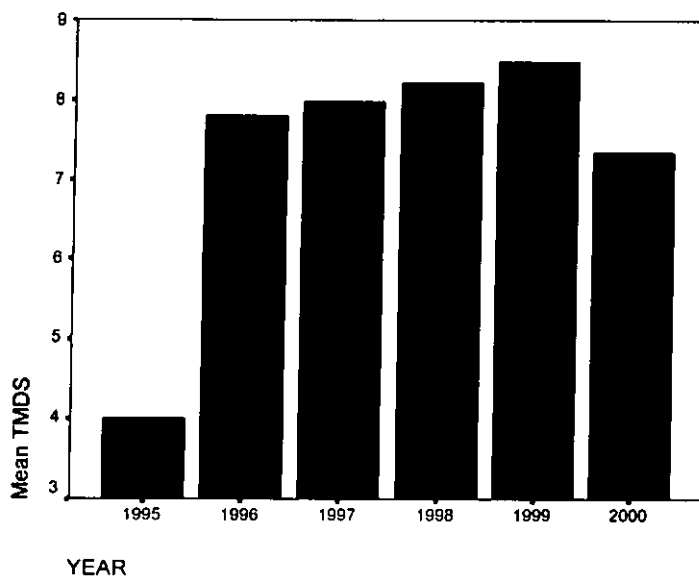
7.1(ii): Consolidated Enterprises, 1995-2000

The mean TMDS of Consolidated Enterprises exhibits similar frequency distribution patterns to their mean SumSeg (compare Exhibit 6.3b on page 74 with Exhibit 7.4b below). However, the mean TMDS in year 2000 drops off showing that *both* the maximum disclosed business segments and geographical segments for Consolidated Enterprises companies became less in that year.

Exhibit 7.4a) Mean and median TMDS for Consolidated enterprises, by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	165	0	19	.00	4.02	5.03
1996	184	0	20	8.00	7.80	4.47
1997	203	0	21	8.00	7.99	4.80
1998	203	0	18	8.00	8.22	4.78
1999	199	0	20	8.00	8.48	4.55
2000	114	0	19	7.00	7.35	5.26
Total	1068	0	21	8.00	7.41	5.00

Exhibit 7.4b) Mean TMDS of Consolidated enterprises, 1995-2000



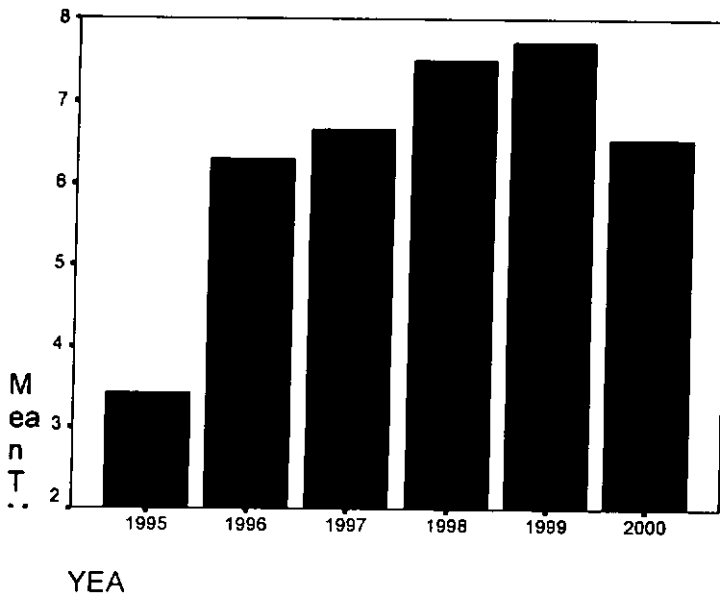
7.1(iii): Properties, 1995-2000

Properties firms' mean TMDS displays the same pattern as their mean SumSeg (compare Exhibit 7.5b below with Exhibit 6.4b on page 75). A drop in mean TMDS for year 2000 (Exhibit 6.2.3c next page) is also noted. Again, it can be attributable to the fact that almost 53% fewer entries were being captured in the sample frame in that year. A sampling error may be the cause for such pronounced decline in the mean TMDS.

Exhibit 7.5a) Mean and median TMDS for Properties firms, by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	86	0	15	.00	3.43	4.45
1996	93	0	16	6.00	6.31	4.45
1997	99	0	16	7.00	6.67	4.41
1998	100	0	16	7.00	7.51	4.35
1999	95	0	18	8.00	7.72	4.34
2000	45	0	16	6.00	6.56	4.74
Total	518	0	18	6.00	6.41	4.63

Exhibit 7.5b) Mean TMDS of Properties firms, 1995-2000



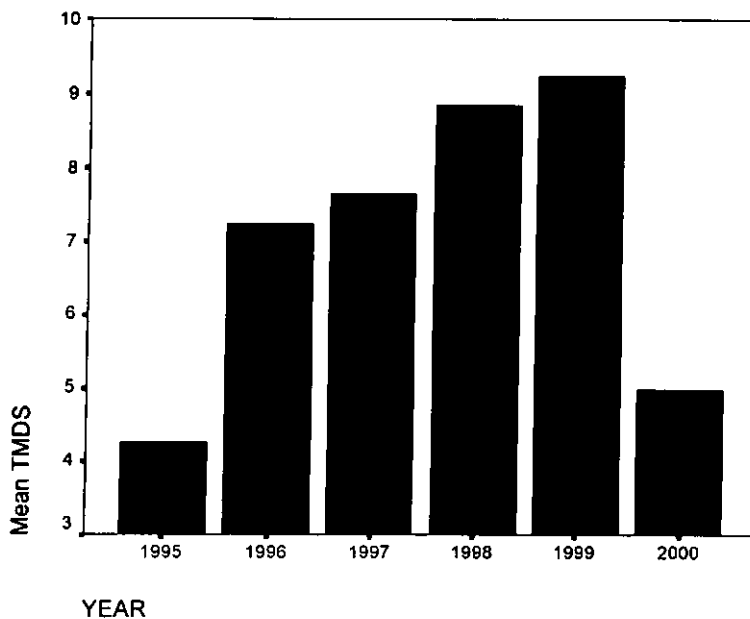
7.1(iv): Hotels, 1995-2000

The Hotels' mean TMDS (Exhibit 7.6b) displays the same distribution pattern as that of mean SumSeg (Exhibit 6.5b on page 76). However, the standard deviations of the mean TMDS begin to converge in 1998 which is not present in the mean SumSeg. It seems that there is less variation in the informativeness disclosed by the Hotels regarding their segments overall.

Exhibit 7.6a) Mean and median TMDS for Hotels, by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	11	0	20	.00	4.27	6.45
1996	12	0	21	6.00	7.25	5.66
1997	12	0	19	7.50	7.67	5.38
1998	13	0	21	9.00	8.85	6.34
1999	13	0	22	7.00	9.23	6.23
2000	10	0	16	5.00	5.00	5.35
Total	71	0	22	7.00	7.20	6.01

Exhibit 7.6b) Mean TMDS for Hotels, 1995-2000



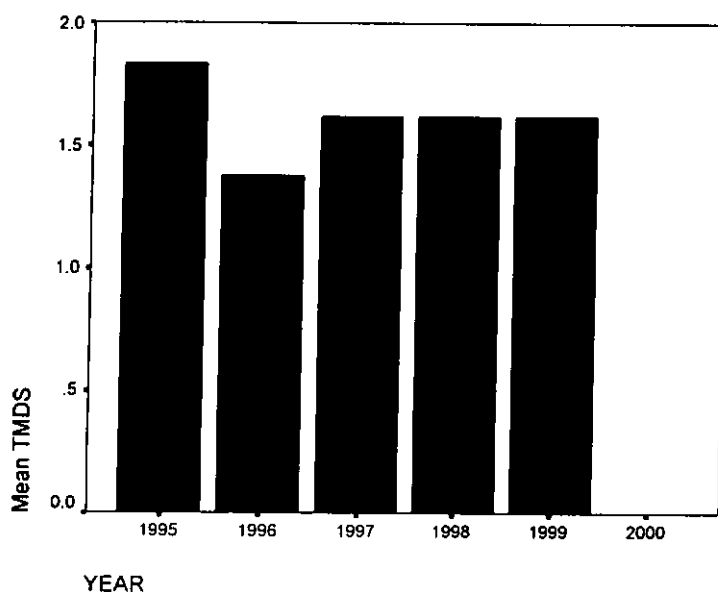
7.1(v): Utilities, 1995-2000

The small sample size of Utilities firms (6 firms in 1995, 8 in 1996-1999, and 5 in 2000) can be easily affected by the nil disclosure of any one Utilities firm. In fact, except the Cross Harbour Tunnel Co. Ltd, no Utilities firm disclosed any geographical segments. The mean TMDS is thus close to the mean SumSeg. Moreover, only three Utilities firms (China and Hong Kong Gas, Hong Kong Ferry, and the Cross Harbour Tunnel) ever disclosed their business segments. The mean TMDS is thus very low: 1.42 segments on average across the time span from 1995 to 2000 (Exhibits 7.7a and 7.7b).

Exhibit 7.7a) Mean and median TMDS for Utilities firms, by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	6	0	6	.00	1.83	2.86
1996	8	0	6	.00	1.38	2.56
1997	8	0	6	.00	1.63	2.39
1998	8	0	6	.00	1.63	2.39
1999	8	0	6	.00	1.63	2.39
2000	5	0	0	.00	.00	.00
Total	43	0	6	.00	1.42	2.28

Exhibit 7.7b) Mean TMDS of Utilities firms, 1995-2000



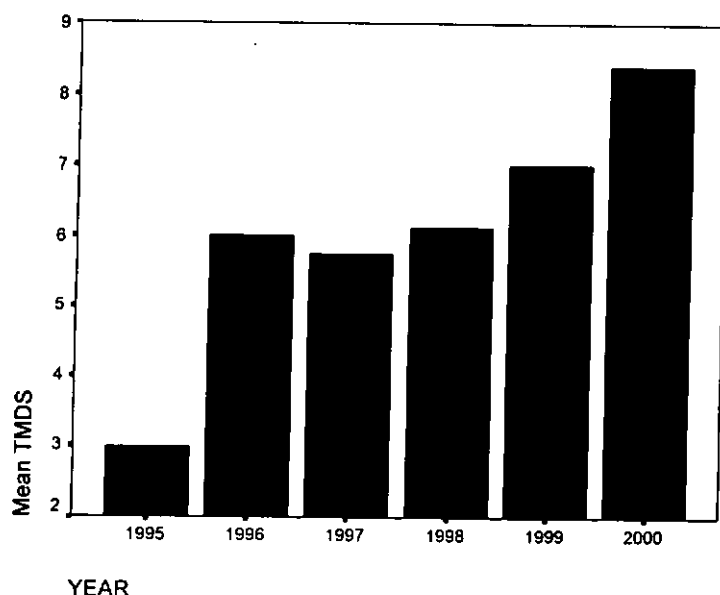
7.1(vi): Others, 1995-2000

Firms in the Others category display a clearer positive skew, and rising distribution pattern using the TMDS treatment than the SumSeg treatment (compare Exhibit 6.7b on page 78 with Exhibit 7.8b below). The standard deviation of mean TMDS is also less diverse than that of the mean SumSeg (compare Exhibits 6.7a and 7.8a).

Exhibit 7.8a) Mean and median TMDS for Others, by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	5	0	7	2.00	3.00	3.32
1996	5	0	12	6.00	6.00	4.74
1997	8	0	17	4.50	5.75	5.82
1998	8	0	18	5.00	6.13	5.57
1999	10	0	16	7.00	7.00	5.72
2000	5	0	16	10.00	8.40	7.13
Total	41	0	18	6.00	6.15	5.41

Exhibit 7.8b) Mean TMDS of Others firms, 1995-2000



7.1(vii): N/A Firms, 1995-2000

The N/A firms category indicates no clear increasing or decreasing pattern either in business segments or geographical segments. The frequency distribution of TMDS (not shown here), however, shows more clearly than the SumSeg that the distribution is positively skewed towards zero, and a mode of 5 TMDS is clearly discernible. The mean TMDS, however, displays similar pattern as the mean SumSeg (see Exhibit 6.8b on page 79 and Exhibit 7.9b below).

Exhibit 7.9a) Mean and median TMDS for N/A firms, by year

YEAR	N	Minimum	Maximum	Median	Mean	Std. Deviation
1995	9	0	15	.00	4.44	6.00
1996	18	0	16	5.50	6.44	4.25
1997	34	0	12	5.00	5.29	3.21
1998	50	0	14	4.00	4.50	3.97
1999	54	0	14	4.00	4.69	4.06
2000	26	0	13	5.00	5.19	4.14
Total	191	0	16	5.00	4.97	4.02

Exhibit 7.9b) Mean TMDS of N/A firms, 1995-2000

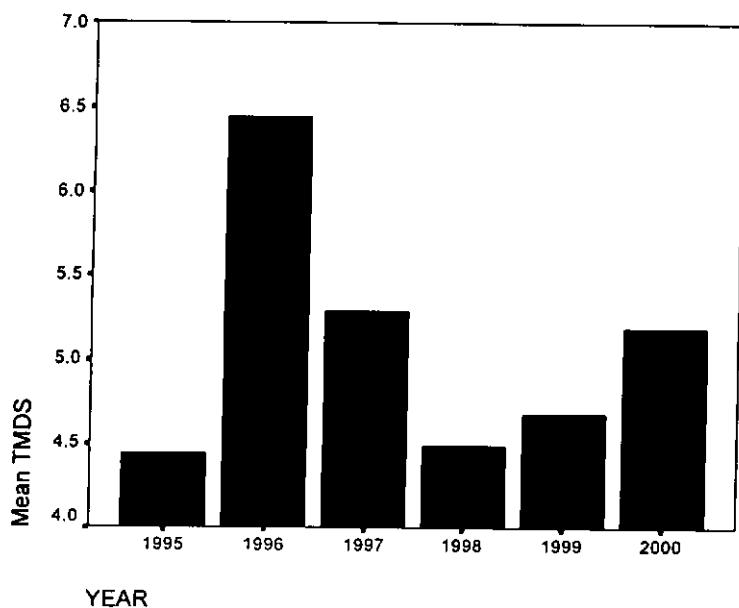


Exhibit 7.10 summarizes the mean TMDS over the period 1995-2000 by industry:

Exhibit 7.10: Mean TMDS by industry, by year, from 1995-2000

Industry	Year						6-year average
	1995	1996	1997	1998	1999	2000	
Industrials	3.42	7.44	7.72	8.49	8.59	8.13	7.37
Con.Entp.	4.02	7.80	7.99	8.22	8.48	7.35	7.41
Properties	3.43	6.31	6.67	7.51	7.72	6.56	6.41
Hotels	4.27	7.25	7.67	8.85	9.23	5.00	7.20
Utilities	1.83	1.38	1.63	1.63	1.63	0.00	1.42
Others	3.00	6.00	5.75	6.13	7.00	8.40	6.15
N/A	4.44	6.44	5.29	4.50	4.69	5.19	4.97

It can be seen that Consolidated Enterprises had the highest 6-year average of TMDS, followed by Industrials firms and Hotels. Utilities companies lag behind all others in terms of disclosing the total maximum of business and geographical segments.

The ranking of the different types of industries based on TMDS is as follows:

- 1) Consolidated Enterprises
- 2) Industrials
- 3) Hotels
- 4) Properties
- 5) Others
- 6) N/A
- 7) Utilities

This ranking is almost identical to that based on SumSeg except that, in SumSeg ranking, Hotels ranks second and Industrials ranks third (see Exhibit 6.9 on page 80). It suggests that TMDS does not materially distort the informativeness of the number of segments.

7.2 Empirical Analysis on Model 4: TMDS

I test my research question 2 to find out if there are any differences using TMDS instead of the SumSeg variable.

Table 7 (page 112) shows the statistical results of Model 4 regressing TMDS on the same set of independent variables and industrial dummy variables as used in the regression Model 3 (using ComISD as the dependent variable, see Table 6, page 99). Similar results are obtained as in Model 3 that all the major independent variables except RONAdiff are significant using the 1-tail test: LnTotAst, D/E-ratio, Siccount, NumEst, FErrPre, and BlockOwn are significant at 5%. Similar to the results in Model 3, the results of Model 4 show that the signs of NumEst and BlockOwn are negative. However, the adjusted R^2 of Model 4 (17.9%) is less than that of Model 3 (22.9%) despite the sample size in both models being the same ($N = 475$).

Table 8 (page 113) shows the Pearson Correlation Coefficients of TMDS and all the dependent variables. None of the correlation coefficients is higher than 0.80 (the highest coefficient being 0.637 between NumEst and LnTotAst) which suggests that the issue of multicollinearity does not seem to be a major factor.

Table 7
Regression Result: Model 4

$$\begin{aligned} \text{TMDS} = & \beta_1 + \beta_2 \text{LnTotAst} + \beta_3 \text{D/E-ratio} + \beta_4 \text{SicCount} + \beta_5 \text{RONAdiff} \\ & + \beta_6 \text{NumEst} + \beta_7 \text{FErrPre} + \beta_8 \text{BlockOwn} \\ & + \beta_9 \text{IndDV2} + \beta_{10} \text{IndDV3} + \beta_{11} \text{IndDV5} \\ & + \beta_{12} \text{IndDV6} + \beta_{13} \text{IndDV7} + \beta_{14} \text{IndDV8} \end{aligned}$$

	Coefficients	t-statistic	p-value ^a
(Constant)	-10.564	-2.453	0.008
LnTotAst	.811	3.847	0.000
D/E-ratio	.002	2.577	0.005
SicCount	.393	3.610	0.000
RONAdiff	.000	-.574	0.283
NumEst	-.065	-2.542	0.005
FErrorlag1	.011	1.845	0.033
BlockOwn	-2.570	-2.966	0.001
IndDV2	.542	1.018	0.155
IndDV3	-1.247	-1.788	0.037
IndDV5	-1.623	-1.689	0.046
IndDV6	-6.654	-6.476	0.000
IndDV7	.962	.308	0.379
IndDV8	N.A.*	N.A.*	N.A.*

Adj. R² = 17.9%

Prob. > F = 0.000

^aOne-tail test.

- TMDS is the Total Maximum Number of Disclosed Segments. LnTotAst is the natural log of total assets. D/E-ratio is the debt/equity ratio. SicCount is the count of SIC codes of the firm as reported in SEQUENCER. RONAdiff is the excess or shortfall against the industry average return on net assets for year *t*. NumEst is the number of non-duplicated estimates in the I/B/E/S database within a 5-month period after a firm's fiscal year-end. FErrPre is the mean forecast error made in previous year (i.e. year *t*-1). BlockOwn is the block share holding percentage held by external institutional investors.
- * The dummy variable IndDV8 has missing correlations with TMDS and is thus deleted from the regression model.

(source: SPSS\0302_Output2_Model 5)

Table 8: Pearson Correlation Coefficients for Model 4: TMDS (N= 475)

Pearson Correlation	TMDS	LnTotAst	D/E-ratio	SicCount	RONAdiff	NumEst	FErrPre	BlockOwn	IndDV2	IndDV3	IndDV5	IndDV6	IndDV7	IndDV8
	1.000													
LnTotAst	.058	1.000												
D/E-ratio	.119	-.106	1.000											
SicCount	.240	.348	-.020	1.000										
RONAdiff	.029	-.016	-.078	-.010	1.000									
NumEst	-.066	.637	-.095	.222	.001	1.000								
FErrPre	.126	-.168	.018	-.036	.126	-.346	1.000							
BlockOwn	-.108	.244	-.039	-.073	-.006	.112	.058	1.000						
IndDV2	.121	-.128	-.034	.038	.402	.038	.025	-.091	1.000					
IndDV3	.013	.503	-.058	.234	-.127	.305	-.012	.194	-.358	1.000				
IndDV5	-.070	.129	-.040	-.131	-.067	.050	-.034	.065	-.181	-.120	1.000			
IndDV6	-.295	.117	-.037	-.076	-.062	.102	-.147	-.061	-.166	-.110	-.055	1.000		
IndDV7	.016	-.018	-.010	.017	-.017	-.051	-.031	.042	-.048	-.032	-.015	-.015	1.000	
IndDV8														1.000
Sig. (1-tailed)	TMDS	LnTotAst	D/E-ratio	SicCount	RONAdiff	NumEst	FErrPre	BlockOwn	IndDV2	IndDV3	IndDV5	IndDV6	IndDV7	IndDV8
	.103	.010	.000	.331	.045	.417	.000	.491	.003	.000	.000	.000	.000	.000
LnTotAst	.005	.363	.000	.019	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
D/E-ratio	.000	.000	.000	.344	.197	.057	.000	.000	.000	.000	.000	.000	.000	.000
SicCount	.267	.000	.000	.000	.197	.205	.000	.000	.000	.000	.000	.000	.000	.000
RONAdiff	.075	.000	.000	.000	.229	.205	.000	.000	.000	.000	.000	.000	.000	.000
NumEst	.003	.000	.000	.000	.105	.105	.000	.000	.000	.000	.000	.000	.000	.000
FErrPre	.009	.000	.000	.000	.191	.191	.000	.000	.000	.000	.000	.000	.000	.000
BlockOwn	.004	.003	.000	.002	.212	.212	.000	.000	.000	.000	.000	.000	.000	.000
IndDV2	.386	.000	.000	.005	.411	.411	.000	.000	.000	.000	.000	.000	.000	.000
IndDV3	.064	.002	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
IndDV5	.000	.005	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
IndDV6	.362	.350	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
IndDV7	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
IndDV8	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

CHAPTER 8: Relationship between Segmental Disclosure and Capital Market

My Research Question 3 (page 4) investigates, given some firms are voluntarily disclosing more segmental information than others, whether segmental disclosure is rewarded by the capital market. It is addressed by testing Hypothesis 8 (P.116).

8.1 Literature Review

Given that an increase in segment disclosure will lower a firm's cost of equity, then would more segment disclosure bring tangible benefits to the firm in the equity market?

Prodhan and Harris (1989) find empirical evidence that for U.S. multinational firms, an increase in geographical segment disclosure decreases uncertainty and the cost of capital.

Balakrishnan, Harris, and Sen (1990) provide evidence that geographic segment data enhance the predictive ability for estimating annual income and sales, subject to the accuracy in forecasting an individual country's growth and fluctuations in exchange rates.

In an experiment setting with the Chartered Financial Analysts (CFAs), **Doupanik and Rolfe** (1990) document findings that CFAs do utilize the aggregation level in assessing the risk of investing in a company which engages in foreign operations. **Kellow** (1990) presents a model to disaggregate the information in the price of shares. He finds that the provision of adequate geographic and industrial breakdown of activities can enhance market feedback.

A direct link between the benefits of increased geographic disclosure and increased equity market returns is provided by **Conover and Wallace** (1995). In their empirical

study, they show a positive relationship between the cumulative abnormal returns (CARs) of 230 sample firms and the number of geographic segments that those firms disclose. Their findings, however, did not cover the line of business segments. Nevertheless, their findings suggest that the more detailed the information released, the higher the equity market returns.

Leuz and Verrecchia (2000) collect empirical evidence on German firms that switch to a more vigorous international reporting regime of either adopting the IAS standards or the U.S. GAAP standards, compared to the domestic German accounting standards. As the German standards lack detailed disclosures, a switch to IAS or U.S. GAAP would mean a commitment to increased levels of disclosure. Their study found that two proxies for the information asymmetry component of the cost of capital—the bid-ask spread and the trading volume—behave in the predicted direction for the firms adopting more disclosure strategies. The bid-ask spread for firms that commit to either IAS or U.S. GAAP exhibit lower percentage bid-ask spreads and higher share turnover than firms using German GAAP, controlling for various firm characteristics like firm size and foreign listing.

8.2 Hypothesis Development

In light of these research findings, I argue that the equity market should reward those firms that have a higher level of disclosure policy, *ceteris paribus*. My hypothesis is as follows:

H8: Firms that have a higher market value, greater number of analysts following in a year, experienced a growth in analysts' interest over the previous year, a higher segment disclosure index, and a higher institutional block share holding will have higher average monthly stock returns differential compared with the industry norm in that same year, after controlling for industry effect.

Brennan and Subrahmanyam (1996) find that, given the same firm size, the average stock return is positively related to the market depth parameter λ ; and for a given λ group, the average return tends to increase with firm size. Their findings also show that the average return is negatively correlated with both the bid-ask spread and the fixed proportional component of trading costs of a firm's shares. It follows that, if the average returns of firms are compared to the firms' respective industry average returns, a larger firm size would lead to a higher level of the firm's average return.

Healy, Hutton, and Palepu (1999) find evidence that an increase in analyst disclosure ratings leads investors to revise upward their valuations of the sample firms' stocks, increases stock liquidity, and creates additional institutional and analyst interest in the stocks. These tangible benefits will collectively lower the cost of capital of the firms with increased disclosure level and significantly improve stock performance in the year of the disclosure increase and the following year.

One of the expected consequences of higher analyst ratings of the firms is that: those firms enjoying higher disclosure ratings should attract more block share holding by the

investment parties (i.e. non-management related parties), if the analysts put their money where their mouth is. A higher block share holding percentage (BlockOwn) would thus be a proxy indicator of such favoured firms of higher rating. In other words, more favoured firms should stand out from others within the same industry and be more likely to provide a monthly return higher than that of their competitors.

I collect the average monthly returns of my sample firms from PACAP December 1998 files (the latest available file at the time of this analysis) and hypothesize that the firm's monthly average return differential (AvRtnDiff) over the industry's norm is influenced by 5 segmental reporting disclosure constructs:

- LnMkCap: the firm's natural logarithm of the firm's market capitalization at balance sheet date (to proxy the firm's size);
- NumEst: the number of non-duplicated earnings estimates made by the analysts following the firm (to proxy the contemporaneous attention given to the firm);
- NumEstGrowth: the increase (or decrease) in the number of estimates over the number of estimates in the previous year;
- ComISD: the composite index of segmental disclosure of a firm's geographical segments, business segments, and profit segments disclosed by the firm (to proxy the level of informativeness disclosed by the sample firms);
- BlockOwn: the percentage (>10%) of block share holding by non-company related parties as disclosed in the annual yearbooks.

I hypothesize that these 5 factors should have positive signs with the differential of the average returns of the firms stock over their industry's respective norm, controlling for industry factors. In other words, I would expect to see a positive relationship between the average monthly returns differential of a firm over the industry average (i.e., above or

below the industry mean) and its market value, its popularity amongst the investing public, its incremental interest to the analysts, and its level of segmental informativeness provided to the investing public, and its percentage of block share holding.

Exhibit 8.1: Hypothesis and Variables Specification Summary for H8

Hypothesis	Dependent Variable	Independent Variables	Expected Sign of relationship
8. Firms with higher market value, greater number of analyst' following, more segments disclosed, and higher institutional holdings will receive higher average monthly return rankings.	Average monthly returns differential of the firms (AvRtnDiff) over the respective industry monthly average return in that year.	Composite Index of Segmental Disclosure (ComISD), controlling for: <ul style="list-style-type: none"> a) market capitalization (LnMkCap); b) the number in earnings estimates (NumEst); c) the increase of the number of non-duplicated earnings estimates over the previous year (NumEstGrowth); d) percentage of institutional block holdings ($\geq 10\%$) of the firm's shares.* 	Positive

* To control for the industry effect, six dummy variables denoting the seven industries will be incorporated in the multiple regression models. The base industry is the Industrials.

8.3 Research Question 3

To answer RQ3 and test Hypothesis 8, I need to determine the average returns of each firm, of each industry, for each year in my sample.

Different industries exhibit different average monthly returns for the same year. To get the amount of the firm's difference between its average monthly returns and its industrial average for the same year, I first calculate the various monthly average returns for each industry i for year t as follows:

Exhibit 8. 2 Industry Average Monthly Returns for 1995-1999

Industry	Industry average monthly returns				
	1995	1996	1997	1998	1999
Industrials	-0.0148	-0.0116	0.0334	0.0202	-0.0251
Con. Entprs.	-0.0226	0.0006	0.0331	-0.0018	-0.0331
Properties	0.0055	0.0014	0.0275	-0.0089	-0.0304
Hotels	0.0228	-0.0019	0.0230	-0.0152	-0.0320
Utilities	-0.0221	0.0140	0.0195	-0.0193	-0.0179
Others	-0.0451	0.0075	0.0783	-0.0281	0.0227
N/A firms	-0.0172	0.0023	-0.0004	-0.0382	-0.0593

I then measure the difference between a firm's average monthly return and its industry's average return. The difference, AvRtnDiff, is used as the dependent variable in Model 4.

8.3.1 Empirical Analysis on Model 5: AvRtnDiff

Table 9 (page 121) shows the regression results on Model 5 where AvRtnDiff is regressed on five independent variables and six dummy variables for the 7 different

industries (base industry is the Industrials). The regression results of Model 5 show that LnMkCap, NumEst, and NumEstGrowth are significant at the 0.4% level or better (one-tail test), whereas ComISD and BlockOwn are not. The sign of NumEst is negative, which suggests that the larger the number of earnings estimates that a firm receives, the lower the monthly average return differential compared with the industry's average.

The Pearson correlation coefficients between the independent variables and the explanatory variables are shown in Table 10 (page 122). Except for the correlation between LnMkCap and NumEst (coefficient = 0.796, p-value = 0.000), all other coefficients are less than 0.80.

The result of Model 5 indicates that firms which have a larger monthly average return differential than the industry's average are positively, though not significantly, related to the ComISD – a measurement of the degree of the firm's segmental disclosure. Hence, my Hypothesis 8 is rejected.

Table 9**Regression Result: Model 5**

$$\begin{aligned} \text{AvRtnDiff} = & \beta_1 + \beta_2 \text{LnMkCap} + \beta_3 \text{NumEst} + \beta_4 \text{NumEstGrowth} + \beta_5 \text{ComISD} \\ & + \beta_6 \text{BlockOwn} + \beta_7 \text{IndDV2} + \beta_8 \text{IndDV3} + \beta_9 \text{IndDV5} + \beta_{10} \text{IndDV6} \\ & + \beta_{11} \text{IndDV7} + \beta_{12} \text{IndDV8} \end{aligned}$$

	Coefficients	t	p-value ^a
(Constant)	-.1561	-3.834	.000
LnMkCap	.0077	3.719	.000
NumEst	-.0008	-2.680	.004
NumEstGrowth	.0035	7.202	.000
ComISD	.0008	.752	.226
BlockOwn	-.0064	-.802	.212
IndDV2	.0013	.292	.385
IndDV3	-.0033	-.547	.292
IndDV5	.0058	.674	.250
IndDV6	-.0021	-.196	.422
IndDV7	.0850	4.072	.000
IndDV8	N.A. *	N.A. *	N.A. *

Adj. $R^2 = 15.7\%$;

Prob. > F = 0.000

N = 482

^a One-tail test

- AvRtnDiff is the average monthly return differential over the industry monthly average return for the same year. LnMkCap is the natural log of market capitalization of the firm. NumEst is the number of non-duplicated estimates in the I/B/E/S database within a 5-month period after a firm's fiscal year-end. NumEstGrowth is the increase of NumEst in year t over year $t-1$ for the same firm. ComISD is the composite index of segmental disclosure. BlockOwn is the block share holding percentage held by external institutional investors.
- * The dummy variable IndDV8 has missing correlations with AvRtnDiff and thus is deleted from the regression model.

(source: SPSS\0227_wkfile6, Output 0227_RQ3)

Table 10: Pearson Correlation Coefficients of Model 5: AvMnReturnDiff (N= 482)

Pearson Correlation	AvMnReturnDiff (N= 482)												
	AvMn ReturnDiff	LnMkCap	NumEst	NumEst Growth	ComlSD	Block	Own	IndDV2	IndDV3	IndDV5	IndDV6	IndDV7	IndDV8
	1.000												
LnMkCap	.168	1.000											
NumEst	.069	.796	1.000										
NumEst Growth	.324	.133	.160	1.000									
ComlSD	.061	.039	-.039	.001	1.000								
Block	.004	.188	.115	.042	-.075	1.000							
Own	-.005	-.067	.009	-.005	.168	-.079	1.000						
IndDV2	.031	.406	.315	.077	.030	.180	-.371	1.000					
IndDV3	-.001	-.073	.030	-.132	-.058	.065	-.182	1.000					
IndDV5	.025	.177	.050	.004	-.224	-.069	-.149	-.102	1.000				
IndDV6	.217	.033	-.033	.082	-.026	.000	-.067	-.046	-.050	1.000			
IndDV7											1.000		
IndDV8												1.000	
Sig. (1-tailed)													
AvMn ReturnDiff	.000												
LnMkCap	.065	.000											
NumEst	.000	.002	.000										
NumEst Growth	.089	.198	.199	.493									
ComlSD	.462	.000	.006	.179	.049								
Block	.456	.071	.422	.454	.000	.042							
Own	.252	.000	.000	.046	.255	.000	.000						
IndDV2	.489	.055	.255	.002	.101	.076	.000	.003					
IndDV3	.289	.000	.139	.465	.000	.065	.001	.012	.135				
IndDV5	.000	.234	.233	.036	.288	.498	.070	.156	.309	.342			
IndDV6	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		
IndDV7	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
IndDV8	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

8.3.2 Empirical Analysis on Model 6: AvRtnDiff with TMDS

For sensitivity analysis, I then substitute TMDS for ComISD to address my Research Question 3 by testing Hypothesis 8. The results are shown in Table 11 on page 124 and the Pearson Correlation Coefficients are in Table 12 on page 118. They are not significantly different from the results obtained by SumSeg and ComISD.

The average monthly return differential of a firm over the industry's norm is positively and significantly related to the firm's market capitalization and to the increase of number of earnings estimates over the previous year. It is also negatively and significantly related to the number of earnings estimates. However, it is positively but not significant statistically related to the TMDS. It is negatively, but not significant, related to the block share ownership by institutional investors. Hence, my Hypothesis 8 is also rejected.

Table 11
Regression Result: Model 6

$$\begin{aligned} \text{AvRtnDiff} = & \beta_1 + \beta_2 \text{LnMkCap} + \beta_3 \text{NumEst} + \beta_4 \text{NumEstGrowth} + \beta_5 \text{TMDS} \\ & + \beta_6 \text{BlockOwn} + \beta_7 \text{IndDV2} + \beta_8 \text{IndDV3} + \beta_9 \text{IndDV5} + \beta_{10} \text{IndDV6} \\ & + \beta_{11} \text{IndDV7} + \beta_{12} \text{IndDV8} \end{aligned}$$

	Coefficients	t	p-value ^a
(Constant)	-.156	-3.860	.000
LnMkCap	.008	3.702	.000
NumEst	-.001	-2.665	.004
NumEstGrowth	.004	7.259	.000
TMDS	.000	1.187	.118
BlockOwn	-.006	-.778	.218
IndDV2	.002	.365	.358
IndDV3	-.003	-.455	.325
IndDV5	.007	.775	.220
IndDV6	.000	-.023	.490
IndDV7	.085	4.088	.000

Adj. R² = 15.9%

Prob. > F = 0.000

^a 1-tail test.

- AvRtnDiff is the average monthly return differential over the industry monthly average return for the same year. LnMkCap is the natural log of market capitalization of the firm. NumEst is the number of non-duplicated estimates in the I/B/E/S database within a 5-month period after a firm's fiscal year-end. NumEstGrowth is the increase of NumEst in year *t* over year *t*-1 for the same firm. TMDS is the total maximum number of disclosed segments. BlockOwn is the block share holding percentage held by external institutional investors.
- * The dummy variable IndDV8 has missing correlations with AvRtnDiff and is thus deleted from the regression model.

(source: SPSS\0304_Output_Model 6)

Table 12: Pearson Correlation Coefficients for Model 6: AvRtnDiff (N = 482)

Pearson Correlation	AvRtnDiff	LnMkCap	NumEst	NumEstGrowth	TMDS	BlockOwn	IndDV2	IndDV3	IndDV5	IndDV6	IndDV7	IndDV8
	1.000											
LnMkCap	.168	1.000										
NumEst	.069	.796	1.000									
NumEstGrowth	.324	.133	.160	1.000								
TMDS	.050	-.027	-.070	-.044	1.000							
BlockOwn	.004	.188	.115	.042	-.072	1.000						
IndDV2	-.005	-.067	.009	-.005	.114	-.079	1.000					
IndDV3	.031	.406	.315	.077	-.019	.180	-.371	1.000				
IndDV5	-.001	.073	.030	-.132	-.088	.065	-.182	-.125	1.000			
IndDV6	.025	.177	.050	.004	-.263	-.069	-.149	-.102	-.050	1.000		
IndDV7	.217	.033	-.033	.082	.020	.000	-.067	-.046	-.023	-.019	1.000	
IndDV8												1.000
Sig. (1-tailed)												
AvRtnDiff	.000											
LnMkCap	.065	.000										
NumEst	.000	.002	.000									
NumEstGrowth	.135	.279	.063	.169								
TMDS	.462	.000	.006	.179	.057							
BlockOwn	.456	.071	.422	.454	.006	.042						
IndDV2	.252	.000	.000	.046	.339	.000	.000					
IndDV3	.489	.055	.255	.002	.027	.076	.000	.003				
IndDV5	.289	.000	.139	.465	.000	.065	.001	.012	.135			
IndDV6	.000	.234	.233	.036	.331	.498	.070	.156	.309	.342		
IndDV7	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
IndDV8												.000

CHAPTER 9: Discussion and Conclusion

9.1 Discussion

The empirical results in the previous chapters show that, before the more rigorous segment disclosure regulation such as the **IAS No. 14 (revised)** became effective, a Hong Kong listed firm selects its segment disclosure level which is significantly related to the following variables:

1. the size of its total assets,
2. its debt/equity ratio,
3. the number of industries the firm operates in,
4. the number of analysts that are following the firm,
5. the mean forecast error of the firm's earnings in the previous year, and
6. the percentage of block share holding owned by institutional investors.

The level of segmental disclosure, measured either in terms of a composite index of segmental disclosure (ComISD), or in terms of the weighted number of business analysis segments (WgBA), or the weighted number of geographical segments (WgGA), is *positively* related to four variables: the size of the firm's total assets (LnTotAst), its debt-equity ratio (D/E-ratio), the number of industries it engages its operations in (SicCount), and the mean forecast error of the firm's earnings in the previous year (FErrPre) (Exhibit 9.1 refers). The managers of Hong Kong listed firms seem to act more or less in line with their Western counterparts; that is, they wish to reduce the analysts' forecast errors gap made in the previous year by increasing disclosure in the current year.

Exhibit 9.1: Expected Signs of Coefficients and the Empirical Results of Explanatory Variables for WgBA, WgGA, and ComISD

Explanatory Variables	Expected Signs	Empirical Signs		
		WgBA	WgGA	ComISD
LnTotAst	+	Positive *	Positive *	Positive *
D/E-ratio	+	Positive *	Positive *	Positive *
SicCount	+	Positive *	Positive *	Positive *
RONAdiff	-	Positive	Positive	Positive
NumEst	+	Negative *	Negative	Negative *
FErrPre	+	Positive *	Positive	Positive *
BlockOwn	+	Negative *	Negative *	Negative *

* significant at 5% confidence level, 1-tail test.

However, the level of segmental disclosure is also *negatively* related to two other variables: the number of analysts' earnings forecasts in that current year (NumEst) and the percentage of block share holding (BlockOwn) owned by institutional investors (both model 3 and model 5 yield the same significant variables and consistent signs). This is consistent with **Botosan's** claims (1997) that firms having a small number of analysts following would enjoy a lower cost of equity capital if they provided greater discretionary information disclosure. But for firms with an existing high level of analysts following, the association between level of disclosure and cost of equity capital is absent. My analysis of Hong Kong firms' disclosure behaviour lends empirical support to her claims.

Moreover, I find that the direction of the two variables— number of analysts forecasts(NumEst) and institutional ownership(BlockOwn)— in combination suggest that a large number of public Hong Kong firms tend to be secretive: when a firm is

capturing a high level of attention from financial analysts, the manager refrains from disclosing too much segment information about the firm to the capital market. Also, the higher the percentage of a firm's stock owned by institutional investors, the less the firm discloses its segments under either business or geographical dimension. This inverse relationship suggests that the manager of a Hong Kong firm discloses its segmental information in private rather than in public (in any case, the institutional investors can always set up separate, exclusive, meetings with management for any in-depth information about the firm's operations). The manager does not feel obliged to disclose as much detailed segmental information to the other investors publicly. This seems to be the case as prescribed by **Hayes and Lundholm** (1996), who point out that in a partial disclosure equilibrium, only firms with sufficiently similar payoffs for their segment activities report separate segment data. When the future payoffs for the business activities are disparate, firms simply report aggregate data to prevent competitors from identifying the more lucrative, profitable segments and to protect excess profits by non-disclosure.

The results of a *t*-test and a Pearson correlation provide evidence that there is a relationship between the larger the firm and the greater the number of analysts following. This is to be expected. Furthermore, firms in Consolidated Enterprises disclose more segments than firms in the Industrials category. This finding is intuitively correct as Consolidated Enterprises, by its very nature, conduct business operations in various industries and thus should be expected to report operating results in more segments than other uni-industry firms like Utilities or Hotels companies.

The results of my study (model 4 and model 6) also show that those Hong Kong firms that enjoy a higher average monthly return differential than their counterparts' within the same industry are significantly related to the following variables:

1. their market capitalization value (positive direction),
2. the number of earnings estimates about the firm in the same current fiscal year (inverse direction), and
3. the growth (or increase) in the number of earnings estimates over the previous year (positive direction).

The positive relationship between a firm's size and its average monthly return differential indicates that higher market-capitalized stocks tend to enjoy higher average returns on a monthly basis. This can be explained as the *size effect*, as investors in the Hong Kong stock market prefer larger firms to smaller firms; and that on average, holding larger firms' stock would yield a higher monthly average return than holding the stocks of smaller firms of the same industry.

The negative relationship with the number of earnings estimates and the positive relationship with the growth of number of earnings estimates merit some discussion. It indicates that the *change* in the number of disclosed segments, rather than the *absolute number* of segments itself, conveys some information or signals which the capital market finds useful.

9.2 Comparison with Other Studies on Segmental Disclosure

My empirical findings also complement **Zarzeski's** study (1996) about Hong Kong firms' level of disclosure. In her study of 256 firms across 7 countries/ economies including Hong Kong, **Zarzeski** derives three key findings: first, higher levels of relative foreign sales relate to higher levels of disclosure. Second, larger firms tend to disclose more information. Third, lower debt ratios relate to higher disclosure. Unlike the rest of the overall sample results, the sign of the coefficient of the debt ratio for Hong Kong firms (N = 29) is positive. My empirical findings on Hong Kong firms support her first and second findings, but my results contradict her third finding. My model 3 and 5 indicate that higher segmental disclosure (in terms of ComISD and TMDS respectively) is positively and significantly related to a firm's Debt/Equity Ratio [**Zarzeski's** results indicate a negative sign on the coefficient of the debt ratio for firms in the overall sample but a positive sign for the firms in Hong Kong].

The above findings of my study are consistent with the those by **Tkac** (1999), whose empirical results lend support to the notion that large firms typically have a larger analyst following and hence greater media coverage. An increase in the number of the earnings estimates over the previous year can thus be seen as a proxy for the external investors' *additional* interest in the particular firm, leading to a higher trading volume of the firm's shares. In similar vein, **Leuz and Verrecchia** (2000) document that a change in disclosure policy with more information made available to the public is often associated with a significant increase in trading volume.

Extant research points out that a higher monthly average stock return, more analyst following, and a larger trading volume are all tangible benefits of increased segmental disclosure. When these tangible benefits are desirable, one would expect that firms would move towards more disclosure of segment information. This is empirically borne out in Hong Kong firms by the increasing mean number of reported segments over the years from 1996 onwards, across all industries except for the Utilities industry. Such exception-to-the-norm, nevertheless, may be explained by the fact that each utility firm operates in its own well-protected oligopolistic if not monopolistic environment. These oligopolistic companies seem to be lacking incentives to increase their reported segments over the years, especially when their counterparts have not initiated to do so.

Piotroski (1999) documents that firms voluntarily expand segment reporting *fineness* usually experience positive earnings forecast revisions without a significant increase in actual operating performance (he defines fineness as the ratio of reported segments to business activities of a firm). **Piotroski** concludes that firms which voluntarily expand segment reporting practices (by stepping up the segmental disclosure fineness) garner some valuation benefits. However, contrary to his conclusions, I find that in my study of Hong Kong firms the level of segment disclosure is *not* significantly associated with the monthly average returns differential of the stock (even though I substitute segment reporting fineness (SegRefine) as defined by **Piotroski** for the two segmental disclosure metrics ComISD and TMDS , the p-value is not significant – see Model 7 below.

Table 13
Regression Result: Model 7

$$\begin{aligned} \text{AvRtnDiff} = & \beta_1 + \beta_2 \text{LnMkCap} + \beta_3 \text{NumEst} + \beta_4 \text{NumEstGrowth} + \beta_5 \text{SegRefine} \\ & + \beta_6 \text{BlockOwn} + \beta_7 \text{IndDV2} + \beta_8 \text{IndDV3} + \beta_9 \text{IndDV5} + \beta_{10} \text{IndDV6} \\ & + \beta_{11} \text{IndDV7} + \beta_{12} \text{IndDV8} \end{aligned}$$

	Coefficients	t	p-value ^a
(Constant)	-.165	-3.921	.000
LnMkCap	.008	3.870	.000
NumEst	-.001	-2.777	.003
NumEstGrowth	.003	6.912	.000
SegRefine	.001	.761	.224
BlockOwn	-.007	-.857	.196
IndDV2	.001	.256	.299
IndDV3	-.004	-.617	.269
IndDV5	.007	.700	.242
IndDV6	-.003	-.279	.290
IndDV7	.084	3.960	.000
IndDV8	N.A.*	N.A.*	N.A.*

Dependent Variable: AvRtnDiff

Adj. R2 = 15.4%

Prob. > F = 0.000

^a 1-tail test.

N = 463

- AvRtnDiff is the average monthly return differential over the industry monthly average return for the same year. LnMkCap is the natural log of market capitalization of the firm. NumEst is the number of non-duplicated estimates in the I/B/E/S database within a 5-month period after a firm's fiscal year-end. NumEstGrowth is the increase of NumEst in year t over year $t-1$ for the same firm. SegRefine is the refineness of segment disclosure measured as the ratio of total number of disclosed segments scaled by the count of SIC codes (SIGCount) as reported in SEQUENCER. BlockOwn is the block share holding percentage held by external institutional investors.
- * The dummy variable IndDV8 has missing correlations with AvRtnDiff and is thus deleted from the regression model.

Table 14: Pearson Correlation Coefficients for Model 7: AvRtnDiff regressed on SegRefine and other variables (N =463)

Pearson Correlation	AvRtnDiff	LnMkCap	NumEst	NumEst Growth	SegRefine	BlockOwn	IndDV2	IndDV3	IndDV5	IndDV6	IndDV7	IndDV8
	1.000											
	.165	1.000										
	.064	.791	1.000									
	.318	.135	.164	1.000								
	.027	-.200	-.198	-.022	1.000							
	.004	.197	.121	.042	-.050	1.000						
	-.010	-.059	.025	-.012	.092	-.086	1.000					
	.025	.394	.294	.082	-.117	.203	-.365	1.000				
	-.002	.102	.065	-.153	-.058	.074	-.172	-.116	1.000			
	.026	.183	.049	.004	-.201	-.073	-.152	-.102	-.048	1.000		
	.219	.034	-.035	.083	.073	-.002	-.069	-.046	-.022	-.019	1.000	
												1.000
Sig. (1-tailed)												
	.000											
	.085	.000										
	.000	.002	.000									
	.281	.000	.000	.319								
	.468	.000	.005	.182	.139							
	.411	.102	.298	.396	.024	.032						
	.298	.000	.000	.038	.006	.000	.000					
	.480	.014	.082	.000	.106	.056	.000	.006				
	.287	.000	.146	.462	.000	.058	.000	.014	.150			
	.000	.232	.228	.037	.059	.485	.070	.161	.320	.339		
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

My test on the difference of the firm's average monthly returns shows that those firms enjoying higher monthly average returns are positively and significantly associated with the log of market capitalization, and the growth in the number of earnings estimates of the firm. However, the number of earnings estimates *per se*, is *negatively* associated with the monthly average return differential compared with other competitors in the same industry. This seems to suggest that the greater the number of analysts following a firm, the smaller the firm's monthly average return advantage relative to its competitors. In other words, the more public attention a firm receives, the less likely its stock would yield an above-average return compared with its competitors operating in the same industry.

This finding is in line with the view of **Shores** (1987), who finds that security price reactions to earnings announcements *decrease* with firm size, the number of analysts following a firm, and the number of market makers. Using an information perspective, **Atias, Bamber and Freeman** (1988) provide a differential reaction argument to lend theoretical support to such an inverse relationship. They posit that as small firms may not have as well developed sources of information as large firms, small firms experience *greater* price and volume reactions at earnings announcement dates than do large firms. As a result, market reactions should be more strongly related to direct measures of alternative information sources such as the number of analysts following the firm, or extent of coverage in the financial news, than to firm size only.

The empirical, inverse relationship between the number of analysts following and a firm's monthly average return compared with its competitors can also be explained by the notion suggested by **Healy, Hutton and Palepu** (1999). They document that increased management disclosure of data which previously are uncovered by analysts will lower the *private* benefits attributable to the financial analysts, thus diluting the abnormal returns, and thereby lowering the monthly average return of the firm's stock. According to **Beaver** (1998), financial analysts are information intermediaries who perform three information-related activities: *private information search*, *prospective analysis of information for prediction*, and *retrospective analysis of events after the fact*. More financial information directly released by the firm, as well as the keener competition among analysts for the interpretation of disclosures, will lessen the *private benefits* of the knowledgeable analysts. The fear of forgoing these private benefits would be the primary motivation why the firms elect to change their segment disclosure practices, despite the fact that they are aware of the public benefits of more disclosure like lower costs of capital.

Why do firms in Hong Kong behave differently from those as stated in the research findings that take place in other accounting jurisdictions? One possible answer is that Hong Kong firms are culturally different. The managers under this overseas Chinese culture prefer disclosing detailed information in private to a few investors compared to the alternative of releasing it to the public at large, if they are not compelled to do so. The findings from my previous chapter support **Gray's** theory (1988) and are consistent with the empirical study by **Salter and Niswander** (1995) that the extent of voluntary

segmental disclosure is closely linked with the uncertainty avoidance and individualism dimensions of a firm's culture.

9.3 Conclusion

In this empirical study on Hong Kong listed companies, I find that firm size, as expressed in terms of total assets, is a significant explanatory variable for a firm's level of segment disclosure. Larger firms tend to disclose more segments. Similarly, firms that have a higher leverage, or that operate in more industries, also disclose more segments. However, a firm's level of segment disclosure is negatively related to the number of analysts' earnings estimates for the current year and is also negatively associated with the block share holding percentage of the firm.

These findings lead to the conclusion that in the Hong Kong business environment, firms prefer a differential practice in segment reporting. On one hand the Hong Kong firms display similar characteristics as predicted by the western researchers: bigger firms disclose more segments; firms operating in more diverse industries report more segments; and higher leveraged firms also exhibit higher levels of segment disclosure. On the other hand, Hong Kong firms tend to behave differently from their Western counterparts. They tend to reduce their level of voluntary segment disclosure to the general public when they have already attracted more attention from the analysts, or when there has been larger institutional investors' holding of the firms' shares. In other words, when there are other

information channels available to the selective investors, the firms tend to be secretive and refrain from disclosing voluntary segmental information to the public.

Segment reporting has conventionally been studied with the approach of cost-and-benefit analysis and that the ultimate criterion lies with the question “What’s in it for the firm to disclose segment information?” or “What are the risks and returns for investors not possessing segment information about the firm?”. Both theoretical and empirical answers to these questions tend to pre-suppose that a *generic* solution to the issue can be found across all economies as to why firms disclose segment information, and to what extent firms should divulge information about their business operations separately. However, my empirical study suggests that it is not necessarily the case. Even though an accounting regime like Hong Kong follows so closely the western market economies in terms of disclosure and accounting standards, the conception of *accounting values* as embodied by the accounting culture could vary from company to company and from regime to regime. It could result in different behaviour and extent in voluntary segmental disclosure. In other words, if the cultural differences among the firms were not taken into consideration, a transplant of international accounting standards for the mere sake of harmonization could not effectively serve the purposes of revising the accounting regulations.

9.4 Limitations of the Study

As the sample data of this study were collected from February to May 2001, some listed firms might not have released their 2000/2001 annual results yet. Their segment reporting data were not fully captured in this study and thus a year-on-year comparison with their previous disclosure patterns may not be feasible. Some firms might take up the strong recommendations from the Hong Kong Society of Accountants (HKSA) to practise the SSAP26 prematurely; some might opt for postponement until it became a statutory requirement. A full coverage of firm data will be more desirable.

Another limitation of the study is that the stock returns data were collected from PACAP files, which were available only up to December 1998. The stock returns for Year 1999 and 2000 were not available at the time of the study. It should be more indicative if the stock returns data for the subsequent years could be included for analysis.

A third limitation is that the metrics adopted in this study, even the Composite Index of Segmental Disclosure (ComISD) are quantitative and ratio scales. Firms disclosing two segments are regarded as twice as much informative as firms disclosing only one segment. A qualitative or an interval scale reflecting the genuine *informativeness* of the segments, or the degree of disclosure, would be more accurate in measuring the intensity of the segmental disclosure.

Finally, the data collected are cross-sectional data. While a cross section may provide a more representative sample of segment disclosure practices of Hong Kong firms, a time-series study can also describe more accurately the impact of the implementation of a more stringent segment disclosure accounting standard. A before-and-after case study of some representative firms to test for the effect of the new **SSAP26** should be a revealing and rewarding exercise.

- The End -

Appendix I a: CHINA MOTION TELECOM INTERNATIONAL LTD: HKD0.75 (p. 1/2)

BUSINESS ANALYSIS

Business Analysis - Turnover

	31-Mar 1996 HK\$m	31-Mar 1997 HK\$m	31-Mar 1998 HK\$m	31-Mar 1999 HK\$m	31-Mar 2000 HK\$m
Mobile Related Serv	-	-	-	163.6	176
VOIP&IP Transport Ser	-	-	-	-	16.1
Multimedia Retail	-	-	-	155.1	240.6
Multimedia Repair	112.4	44.3	57.3	63.3	56
Network Trunking Serv	32.9	-	6	19.7	28.1
Network Leasing Optn	9.1	15.8	17.5	25.2	31.7
Unified Messaging Ser	3.4	209.4	268.4	212.5	262.9
Telecare Services	-	-	-	-	1.5
Internet & e-commerce	-	-	-	-	0.1
Trading Operation	439.8	601.1	421.9	224.2	78
Technical Services	20	12.5	5	-	-
Others	1.5	3.9	4.8	-	-
Adjustment accounts	-	-	-	-10.8	-11.7
TURNOVER	619.1	886.9	780.8	852.8	879.5
	-----	-----	-----	-----	-----
	619.1	886.9	780.8	852.8	879.5
	-----	-----	-----	-----	-----

Business Analysis - Profit before tax

	31-Mar 1996 HK\$m	31-Mar 1997 HK\$m	31-Mar 1998 HK\$m	31-Mar 1999 HK\$m	31-Mar 2000 HK\$m
Mobile Related Serv	-	-	-	121.2	124.7
VOIP&IP Transport Ser	-	-	-	-	0.1
Multimedia Retail	-	-	-	11	18.3
Multimedia Repair	18.1	20.7	21.3	31.7	33.6
Network Trunking Serv	2	-	-5.7	-5.2	1.6
Network Leasing Optn	0.9	6.4	6.6	10.2	11.7
Unified Messaging Ser	13.8	28.7	48	56.7	8.8
Telecare Services	-	-	-	-	0.1
Internet & e-commerce	-	-	-	-	-13.6
Trading Operations	27.3	20.1	3	20.6	5.2
Technical Services	16.8	9.6	3.4	-	-
Others	16.2	16.9	12.3	-	-
Operating & admin exp	-	-	-	-129.1	-81.7
Assoc cos profit	0.4	5.8	13	3.7	1
Net interest expense	-	-9.5	-9.2	-49	-47.2
PROFIT	95.5	98.7	92.7	71.8	62.6
BEFORE TAX					
	-----	-----	-----	-----	-----
	95.5	98.7	92.7	71.8	62.6
	-----	-----	-----	-----	-----

Appendix I a: CHINA MOTION TELECOM INTERNATIONAL LTD: HKD0.75 (p. 2/2)

Business Analysis - Net assets

	31-Mar 1996 HK\$m	31-Mar 1997 HK\$m	31-Mar 1998 HK\$m	31-Mar 1999 HK\$m	31-Mar 2000 HK\$m
Mobile Related Serv	-	-	-	587	347.9
VOIP&IP Transport Ser	-	-	-	1.6	11.6
Multimedia Retail	-	-	-	39.5	54.7
Multimedia Repair	-	-	-	40.7	21.9
Network Trunking Serv	-	-	-	92.3	111.7
Network Leasing Optn	-	-	-	182.4	180.6
Unified Messaging Ser	-	-	-	115.9	182.2
Telecare Services	-	-	-	-	0.4
Internet & e-commerce	-	-	-	-	42.7
Trading Operation	-	-	-	153.4	96.2
Associates	-	-	-	7.6	8.6
Corporate	-	-	-	354.5	384.2
Liabilities & corp	-	-	-	-894.7	-571
NET ASSETS	-	-	-	680.1	871.7
	-----	-----	-----	-----	-----
	-	-	-	680.1	871.7
	-----	-----	-----	-----	-----

Appendix I b: CHINA MOTION TELECOM INTERNATIONAL LTD: HKD0.75

GEOGRAPHICAL ANALYSIS

Geographical Analysis - Turnover by source

	31-Mar 1996	31-Mar 1997	31-Mar 1998	31-Mar 1999	31-Mar 2000
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Hong Kong	77.6	128.3	155.2	281.8	496.4
P.R. China	541.5	758.6	625.6	581.8	394.8
Adjustment accounts	-	-	-	-10.8	-11.7
	-----	-----	-----	-----	-----
	619.1	886.9	780.8	852.8	879.5
	-----	-----	-----	-----	-----

Geographical Analysis - Profit before tax by source

	31-Mar 1996	31-Mar 1997	31-Mar 1998	31-Mar 1999	31-Mar 2000
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Hong Kong	3.5	-2.5	2.2	-72.6	-20.1
P.R. China	91.6	104.9	86.8	189.7	210.6
Intra-group	0.4	-	-	-	-
Operating & admin exp	-	-	-	-1.2	-81.7
Assoc co profit	-	5.8	13	3.7	1
Net interest exp	-	-9.5	-9.2	-47.8	-47.2
	-----	-----	-----	-----	-----
	95.5	98.7	92.7	71.8	62.6
	-----	-----	-----	-----	-----

Geographical Analysis - Net assets

	31-Mar 1996	31-Mar 1997	31-Mar 1998	31-Mar 1999	31-Mar 2000
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Hong Kong	-	-	-	969.2	645.5
P.R. China	-	-	-	605.6	797.2
Liabilities	-	-	-	-894.7	-571
	-----	-----	-----	-----	-----
	-	-	-	680.1	871.7
	-----	-----	-----	-----	-----

Appendix II a: ALBATRONICS, FAR EAST CO LTD: HKD0.10

BUSINESS ANALYSIS

BUSINESS ANALYSIS Turnover

	31-Mar 1994	31-Mar 1995	31-Mar 1996	31-Mar 1997	31-Mar 1998
	HK\$ 000	HK\$ 000	HK\$ 000	HK\$ 000	HK\$ 000
Distrib of Semi-Cond	446,651	600,497	327,124	400,073	484,647
Distrib of CD Mech	650,814	738,027	608,907	852,273	817,208
Electr Circuit boards	468,433	457,811	303,537	299,900	320,761
Consumer Electric pro	185,932	535,130	879,422	962,791	1,111,601
	-----	-----	-----	-----	-----
	1,751,830	2,331,465	2,118,990	2,515,037	2,734,217
	-----	-----	-----	-----	-----

BUSINESS ANALYSIS Profit Before Tax

	31-Mar 1996	31-Mar 1997	31-Mar 1998 a	31-Dec 1998
	HK\$ 000	HK\$ 000	HK\$ 000	HK\$ 000
Distrib of Semi-Cond	7,520	8,772	5,441	-3,973
Distrib of CD Mech	1,498	8,207	5,736	-5,012
Electr Circuit boards	4,251	19,001	13,540	-20,031
Consumer Elec prods	3,700	20,436	36,583	-25,486
Exceptional charges	31,365	11,150	-	446,351
Assoc cos profit	4,411	5,926	3,806	1,373
Borrowing Costs, net	35,646	38,382	38,203	32,264
	-----	-----	-----	-----
	-45,631	12,810	26,903	-531,744
	-----	-----	-----	-----

a)9 month period.

Appendix II b: ALBATRONICS, FAR EAST CO LTD: HKD0.10

GEOGRAPHICAL ANALYSIS

GEOGRAPHICAL ANALYSIS --Turnover By Market

	31-Mar 1995 HK\$000	31-Mar 1996 HK\$000	31-Mar 1997 HK\$000	31-Mar a 1998 HK\$000	31-Dec 1998 HK\$000
Japan	340,234	439,154	433,975	592,841	522,852
Hong Kong	1,699,719	1,226,878	1,429,241	1,526,727	1,049,649
P.R. China	291,512	452,958	651,821	614,649	51,689
	-----	-----	-----	-----	-----
	2,331,465	2,118,990	2,515,037	2,734,217	1,624,190
	-----	-----	-----	-----	-----

a) 9-month period.

GEOGRAPHICAL ANALYSIS -- Profit Before Tax By Market

	31-Mar 1996 HK\$000	31-Mar 1997 HK\$000	31-Mar a 1998 HK\$000	31-Dec 1998 HK\$000
Japan	5,532	10,237	14,821	-15,351
Hong Kong	18,090	34,814	34,186	-16,080
P.R. China	-6,653	11,365	12,293	-23,071
Exceptional chgs	-31,365	-11,150	-	-446,351
Assoc co profit	4,411	5,926	3,806	1,373
Net interest exp	-35,646	-38,382	-38,203	-32,264
	-----	-----	-----	-----
	-45,631	12,810	26,903	-531,744
	-----	-----	-----	-----

a) 9-month period.

Appendix III

CHINA UNICOM LTD INC :HKD0.10

BUSINESS ANALYSIS**Business Analysis - Turnover**

	31-Dec a 1997	31-Dec a 1998	31-Dec a 1999
	RMBm	RMBm	RMBm
Cellular	973.5	2,442.30	5,841.10
Paging	12,400.10	11,586.40	11,529.70
Long distance & data	-	-	79.2
	-----	-----	-----
	13,373.60	14,028.70	17,450.00
	-----	-----	-----

Business Analysis - Profit before tax

	31-Dec a 1997	31-Dec a 1998	31-Dec a 1999
	RMBm	RMBm	RMBm
Cellular	-491.9	-356.4	-71.9
Paging	1,812.60	1,231.50	1,792.30
Long distance & data	-	-	38.6
	-----	-----	-----
	1,320.70	875.2	1,759.00
	-----	-----	-----

Business Analysis - Net assets

	31-Dec a 1997	31-Dec a 1998	31-Dec a 1999
	RMBm	RMBm	RMBm
Cellular	-	-145.6	400.9
Paging	-	6,514.10	7,404.60
Others	-	39.4	732.8
Minority interest	-	2,516.00	2,530.30
	-----	-----	-----
	-	8,923.90	11,068.60
	-----	-----	-----

a) Figures extracted from prospectus

Appendix IV a: DAILYWIN GROUP LTD: HKD0.10

BUSINESS ANALYSIS

Business Analysis - Turnover

	31-Mar 1996 HK\$m	31-Mar 1997 HK\$m	31-Mar 1998 HK\$m	31-Mar 1999 HK\$m	31-Mar 2000 HK\$m
Assem & manufacturing	195.8	205	188.7	119.2	169.3
Retail sales	30.4	61	58.6	41.2	60.3
Sales, watch movemts	141.7	111.3	125.4	68.3	8.4
Prop inv & holding	-	-	-	0.1	0.2
	<u>368</u>	<u>377.3</u>	<u>372.7</u>	<u>228.9</u>	<u>238.1</u>

Business Analysis - Profit before tax

	31-Mar 1996 HK\$m	31-Mar 1997 HK\$m	31-Mar 1998 HK\$m	31-Mar 1999 HK\$m	31-Mar 2000 HK\$m
Assem & manufacturing	12.8	13.7	5.4	-36.3	3
Retail sales	4.8	9.3	-0.8	-42	-2.9
Sales, watch movemts	11.6	6.4	3	-8.9	*
Prop inv & holding	-0.3	-0.3	-0.3	-0.2	-0.1
Net interest expense	-1.1	-3.7	-5.4	-5.6	-6.8
	<u>27.8</u>	<u>25.4</u>	<u>1.9</u>	<u>-93</u>	<u>-6.8</u>

Business Analysis - Net assets

	31-Mar 1996 HK\$m	31-Mar 1997 HK\$m	31-Mar 1998 HK\$m	31-Mar 1999 HK\$m	31-Mar 2000 HK\$m
Assem & manufacturing	50.6	54.3	49.7	-0.6	-1.6
Retail sales	16.2	21.5	30.6	0.1	-2.8
Sales, watch movemts	16.1	19.6	19.5	8	7.5
Prop inv & holding	2.4	4.3	3.3	1.4	1.7
Minority interests	0.2	0.5	0.3	-	-
	<u>85.5</u>	<u>100.3</u>	<u>103.4</u>	<u>8.9</u>	<u>4.8</u>

*) Details not shown due to rounding

Appendix IV b: DAILYWIN GROUP LTD: HKD0.10

GEOGRAPHICAL ANALYSIS

Geographical Analysis -- Turnover by source

	31-Mar 1996	31-Mar 1997	31-Mar 1998	31-Mar 1999	31-Mar 2000
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Hong Kong	141.7	111.3	125.4	69.1	8.7
P.R. China	226.3	266.1	247.3	159.8	229.4
	-----	-----	-----	-----	-----
	368	377.3	372.7	228.9	238.1
	-----	-----	-----	-----	-----

Geographical Analysis --Turnover by market

	31-Mar 1996	31-Mar 1997	31-Mar 1998	31-Mar 1999	31-Mar 2000
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
UK	-	9.7	13.7	3.3	2.6
France	-	-	0.1	13.2	17.5
Switzerland	40.4	66.5	54.1	20.6	16.9
USA	97.6	105.1	104.8	58.7	97.8
Japan	17.9	5.4	1.4	2	0.6
Hong Kong	160.1	116.3	132	74.9	12.2
P.R. China	30.4	61	58.6	41.2	60.3
India	-	-	6.7	9.3	20.5
Others	21.5	13.4	1.3	5.8	9.6
	-----	-----	-----	-----	-----
	368	377.3	372.7	228.9	238.1
	-----	-----	-----	-----	-----

Geographical Analysis -- Profit before tax by source

	31-Mar 1996	31-Mar 1997	31-Mar 1998	31-Mar 1999	31-Mar 2000
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Hong Kong	11.1	5.8	-2.3	-9.1	-0.8
P.R. China	17.8	23.4	9.5	-78.3	0.9
Net interest exp	-1.1	-3.7	-5.4	-5.6	-6.8
	-----	-----	-----	-----	-----
	27.8	25.4	1.9	-93	-6.8
	-----	-----	-----	-----	-----

Geographical Analysis -- Net assets

	31-Mar 1996	31-Mar 1997	31-Mar 1998	31-Mar 1999	31-Mar 2000
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Hong Kong	-	-	-	39.4	36.7
P.R. China	-	-	-	-30.6	-31.9
	-----	-----	-----	-----	-----
	-	-	-	8.9	4.8
	-----	-----	-----	-----	-----

Appendix V a: FIRST PACIFIC CO LTD: USD0.01

BUSINESS ANALYSIS

Business Analysis - Turnover

	31-Dec 1996 US\$m	31-Dec 1997 US\$m	31-Dec 1998 US\$m	31-Dec 1999 US\$m
Consumer	-	7,273.70	2,115.20	456.7
Telecommunications	-	436.4	241.3	307.2
Property	-	470.6	452.8	378.4
Banking	-	127.7	85.1	89.2
TURNOVER	-	8,308.40	2,894.40	1,231.50
	-----	-----	-----	-----
	-	8,308.40	2,894.40	1,231.50
	-----	-----	-----	-----

Business Analysis - Profit before tax

	31-Dec 1996 US\$m	31-Dec 1997 US\$m	31-Dec 1998 US\$m	31-Dec 1999 US\$m
Consumer	-	254.3	34.1	44.7
Telecommunications	-	61.9	12.1	26
Property	-	97.3	45.3	55.2
Banking	-	55.8	18.1	-1.5
Adjustment accounts	-	183.3	111	30.1
Exceptional charges	-	-16.7	317	97.5
Assoc cos profit	-	38.5	-1.4	67.5
Net interest expense	-	-172.2	-85.9	-83
PROFIT BEFORE TAX	-	502.2	450.3	236.5
	-----	-----	-----	-----
	-	502.2	450.3	236.5
	-----	-----	-----	-----

Business Analysis - Net assets

	31-Dec 1996 US\$m	31-Dec 1997 US\$m	31-Dec 1998 US\$m	31-Dec 1999 US\$m
First Pacific Company	-	-	1,077.90	-
Consumer	-	-	278.4	-
Marketing & distrib	957.3	901.1	-	-
Invest & banking	297.8	425.3	394.8	-
Property	372.1	1,102.20	1,463.50	-
Telecommunications	496.3	347.6	1,161.90	-
Others	256.2	411.6	-2,179.20	-
Goodwill reserve	-1,249.60	-1,289.20	-	-
NET ASSETS	1,130.10	1,898.60	2,197.30	1,942.5 a
	-----	-----	-----	-----
	1,130.10	1,898.60	2,197.30	1,942.5 a
	-----	-----	-----	-----

a) No available information

Appendix V b: FIRST PACIFIC CO LTD: USD0.01

GEOGRAPHICAL ANALYSIS

Geographical Analysis – Turnover by source

	31-Dec 1995 US\$m	31-Dec 1996 US\$m	31-Dec 1997 US\$m	31-Dec 1998 US\$m	31-Dec 1999 US\$m
Europe	2,297.50	3,261.40	3,522.20	-	-
Americas	900.3	1,106.70	1,319.80	-	-
Asia/Far East	2,051.90	2,657.60	3,466.40	-	-
	-----	-----	-----	-----	-----
	5,249.70	7,025.70	8,308.40	2,894.4 a	1,231.5 a
	-----	-----	-----	-----	-----

a) No available information

Appendix VI a: THE CROSS- HARBOUR(HOLDINGS) LTD: HKD1

BUSINESS ANALYSIS

Business Analysis - Turnover

	31-Dec 1995	31-Dec 1996	31-Dec 1997	31-Dec a 1998	31-Dec 1999
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Tunnel	390.6	412.2	426.6	395.7	254
Motoring School	333.4	351.3	379.6	368	302
Treasury Investment	44.2	33.5	34.7	70	43.2
TURNOVER	768.1	797	840.8	833.7	599.2
	-----	-----	-----	-----	-----
	768.1	797	840.8	833.7	599.2
	-----	-----	-----	-----	-----

Business Analysis - Profit before tax

	31-Dec 1995	31-Dec 1996	31-Dec 1997	31-Dec a 1998	31-Dec 1999
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Tunnel	189.4	193.1	299.7	264.4	167.3
Motoring School	30.1	60.6	88.6	64.8	55.9
Treasury Investment	69.5	59.9	55	9.6	57.2
Assoc cos profit	-	-	-131.9	-104.7	-54.3
PROFIT BEFORE TAX	289.1	313.5	311.4	234.1	226
	-----	-----	-----	-----	-----
	289.1	313.5	311.4	234.1	226
	-----	-----	-----	-----	-----

a) Restated to reflect the change in accounting policies for investments in securities in order comply with SSAP24

Appendix VI b: THE CROSS- HARBOUR(HOLDINGS) LTD: HKD 1.

GEOGRAPHICAL ANALYSIS

Geographical Analysis -- Turnover by source

	31-Dec 1995 HK\$m	31-Dec 1996 HK\$m	31-Dec 1997 HK\$m	31-Dec 1998 HK\$m	31-Dec 1999 HK\$m
North America	36.8	24	-	-	-
Hong Kong	731.3	773	-	-	-
	-----	-----	-----	-----	-----
	768.1	797	840.8 a	833.7 a	599.2
	-----	-----	-----	-----	-----

Geographical Analysis -- Profit before tax by source

	31-Dec 1995 HK\$m	31-Dec 1996 HK\$m	31-Dec 1997 HK\$m	31-Dec 1998 HK\$m	31-Dec 1999 HK\$m
North America	36.7	23.9	-	-	-
Hong Kong	252.3	289.7	-	-	-
	-----	-----	-----	-----	-----
	289.1	313.5	311.4 a	234.1 a	226 a
	-----	-----	-----	-----	-----

a) No available information

Appendix VII a: THEME INTERNATIONAL HOLDINGS LTD: HKD0.01

BUSINESS ANALYSIS

Business Analysis - Turnover

	31-Mar 1996 HK\$m	31-Mar 1997 HK\$m	31-Mar 1998 HK\$m	31-Mar 1999 HK\$m	31-Mar 2000 HK\$m
Retailing & trading	-	884.9	666.6	-	-
Operation of stores	-	-	389.9	-	-
TURNOVER	742.0 b	884.9	1,056.50	319.2 a	255.8 a
	-----	-----	-----	-----	-----
	742.0 b	884.9	1,056.50	319.2 a	255.8 a
	-----	-----	-----	-----	-----

Business Analysis - Profit before tax

	31-Mar 1996 HK\$m	31-Mar 1997 HK\$m	31-Mar 1998 HK\$m	31-Mar 1999 HK\$m	31-Mar 2000 HK\$m
Retailing & trading	-	59.2	405.6	-	-
Investment in secs	-	21.9	24.1	-	-
Operation of stores	-	-	99.2	-	-
Adjustment accounts	-	-	-1,057.90	-	-
Exceptional charges	-	-	-338.9	-	-
Assoc cos profit	-	32	19.3	-	-
PROFIT BEFORE TAX	40.5 b	113.2	-848.5	(218.0)a	-41.2 a
	-----	-----	-----	-----	-----
	40.5 b	113.2	-848.5	(218.0)a	-41.2 a
	-----	-----	-----	-----	-----

- a) No available information
- b) Breakdown not disclosed

Appendix VII b: THEME INTERNATIONAL HOLDINGS LTD: HKD0.01

GEOGRAPHICAL ANALYSIS

Geographical Analysis -- Turnover by source

	31-Mar 1996	31-Mar 1997	31-Mar 1998	31-Mar 1999	31-Mar 2000
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Singapore	-	-	389.9	-	-
Hong Kong	483.8	475.6	316.3	84.7	36.4
Taiwan	125.4	179.4	175.5	134	123
P.R. China	63.9	156.1	134.3	87.3	94.1
Others	68.8	73.9	40.4	13.3	2.3
	-----	-----	-----	-----	-----
	742	884.9	1,056.50	319.2	255.8
	-----	-----	-----	-----	-----

Geographical Analysis -- Profit before tax by source

	31-Mar 1996	31-Mar 1997	31-Mar 1998	31-Mar 1999	31-Mar 2000
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Singapore	-	-	99.2	-	-
Hong Kong	-	-	259	145.1	24.8
Taiwan	-	-	54.6	9.4	0.8
P.R. China	-	-	115.4	13	1.6
Others	-	-	0.7	-0.8	-0.3
Adjustment accounts	-	-	-1,057.90	-321.4	-55.1
Exceptional chgs	-	-	-338.9	-62.6	-13.1
Assoc co profit	-	-	19.3	-0.8	0.1
	-----	-----	-----	-----	-----
	-	-	-848.5	-218	-41.2
	-----	-----	-----	-----	-----

Appendix VIII: ASM PACIFIC TECHNOLOGY LTD: HKD0.10**GEOGRAPHICAL ANALYSIS**

Geographical Analysis= Turnover by market

	31-Dec 1995 HK\$m	31-Dec 1996 HK\$m	31-Dec 1997 HK\$m	31-Dec 1998 HK\$m	31-Dec 1999 HK\$m
Europe	40.9	81.6	47.4	41.8	51.6
USA	198.1	134.2	132.5	119.2	95.5
Japan	56.6	37.4	48	51.7	
Singapore	368	358.5	350.7	99.8	97.1
Hong Kong	197.3	212.8	253.9	169.6	132.2
Malaysia	123.2	104.5	86.1	174.3	466.7
Thailand	147.9	87.9	64.5	83.9	235.1
Philippines	-	-	-	61.2	146.7
Korea	58	43.9	42.9	8.1	180
Taiwan	323.6	229.8	294.2	446.2	299.2
P.R. China	27.3	46.7	110.8	44.1	103.9
Others	25.5	19.7	33.5	25.4	35.3
	----- 1,566.40 -----	----- 1,357.10 -----	----- 1,464.40 -----	----- 1,325.30 -----	----- 1,890.90 -----

Appendix IX a: CITY E-SOLUTIONS LTD :HKD1(POST RECON)

BUSINESS ANALYSIS

Business Analysis - Turnover

	31-Dec 1995	31-Dec 1996	31-Dec 1997	31-Dec 1998	31-Dec 1999
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Development prop	78.2	226.1	147.5	323.5	142.1
Hotel Operations	3,444.60	4,924.50	4,835.60	4,773.70	4,861.50
Property Rental	96.6	101.2	85.3	77.8	84.2
Investment Trading	11.1	0.2	1.8	1.8	0.1
Investment Holding	136.7	1.3	0.5	0.2	1.8
Leisure	39.2	37.8	17.8	6.8	11.6
Design ConsultancyFee	4.6	-	-	-	-
	-----	-----	-----	-----	-----
	3,811.20	5,291.10	5,088.50	5,183.80	5,101.30
	-----	-----	-----	-----	-----

Business Analysis - Profit before tax

	31-Dec 1995	31-Dec 1996	31-Dec 1997	31-Dec 1998	31-Dec 1999
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Development Prop	32.6	62.2	53.6	41.5	33.6
Hotel Operations	687.9	953.5	1,030.40	1,036.90	1,034.00
Property Rental	27.6	47.1	43.4	37.6	47.1
Investment Trading	3.2	1.9	-17.8	0.3	5.3
Investment Holding	-46.5	-56.1	-123.5	-17.4	57.7
Leisure	4.2	5	-18.5	-10.8	-4.7
Design ConsultancyFee	3.1	0.3	0.2	-1.8	-0.1
Exceptional charges	-	152.7	-	140.3	159.5
	-----	-----	-----	-----	-----
	712	1,166.40	967.8	1,226.60	1,332.30
	-----	-----	-----	-----	-----

Appendix IX b: CITY E-SOLUTIONS LTD : HKD1(POST RECON)

GEOGRAPHICAL ANALYSIS

Geographical Analysis= Turnover by source

	31-Dec 1995 HK\$m	31-Dec 1996 HK\$m	31-Dec 1997 HK\$m	31-Dec 1998 HK\$m	31-Dec 1999 HK\$m
UK	519.5	1,349.30	1,660.80	1,819.40	1,747.20
Germany	18.5	72.8	63.2	59.4	50.8
France	25.3	126.8	83.1	93	152.6
Netherlands	0.1	-	-	-	-
USA	618.5	733.4	792.5	890.8	1,066.60
Singapore	653	721.2	615.3	516	448.7
Hong Kong	0.6	1.1	0.5	0.2	1.8
Malaysia	291.1	288	161.5	120.1	105.7
Philippines	155.6	217.3	168	160.6	146.1
Indonesia	39.5	47.2	105.3	24.2	27.5
Korea	-	-	-	-	47.4
Taiwan	655.9	693.6	660.9	651.5	636.7
Australia	159.3	200.6	160.9	353.3	163.9
New Zealand	674.2	839.7	616.6	495.3	506.4
	----- 3,811.20 -----	----- 5,291.10 -----	----- 5,088.50 -----	----- 5,183.80 -----	----- 5,101.30 -----

Geographical Analysis= Profit before tax by source

	31-Dec 1995 HK\$m	31-Dec 1996 HK\$m	31-Dec 1997 HK\$m	31-Dec 1998 HK\$m	31-Dec 1999 HK\$m
UK	104.8	376.6	536.4	517.2	538
Germany	-5.8	5.4	-4.8	5.2	-18.9
France	-7	-24.6	-45.8	-3	-32.7
Netherlands	-1	-	-	-	-
USA	42.8	101.3	158.7	260.2	304.8
Singapore	235	237.3	156.9	153.7	123.5
Hong Kong	34.4	49.5	-56.8	-40.1	48.9
Malaysia	47.5	23.3	-11.1	-31.8	-35.1
Philippines	39	70.7	62.5	58.9	67.9
Indonesia	4.2	3.2	-25.5	-48.8	-33.4
Korea	-	-	-	-	4
Taiwan	120.3	91.1	122.7	139.1	145.9
Australia	-1.9	13.8	19.6	23	13
New Zealand	99.7	66.1	55	52.7	47.1
Exceptional chgs	-	152.7	-	140.3	159.5
	----- 712 -----	----- 1,166.40 -----	----- 967.8 -----	----- 1,226.60 -----	----- 1,332.30 -----

Appendix X a: GIORDANO INTERNATIONAL LIMITED: HKD0.05**BUSINESS ANALYSIS****Business Analysis - Turnover**

	31-Dec 1996 HK\$m	31-Dec 1997 HK\$m	31-Dec 1998 HK\$m	31-Dec 1999 HK\$m
Retail and Distr	3,061.20	2,732.80	2,296.40	2,891.40
Manufacturing	460.9	281.6	312.9	200.7
TURNOVER	3,522.00	3,014.40	2,609.20	3,092.20
	-----	-----	-----	-----
	3,522.00	3,014.40	2,609.20	3,092.20
	-----	-----	-----	-----

Business Analysis - Profit before tax

	31-Dec 1996 HK\$m	31-Dec 1997 HK\$m	31-Dec 1998 HK\$m	31-Dec 1999 HK\$m
Retail and Distr	243	164	56.2	317
Manufacturing	50.6	8	10.7	30.8
Exceptional charges	-	-116.2	-	-
Assoc cos profit	21.9	26.1	21.5	73.4
PROFIT BEFORE TAX	315.4	82	88.3	421.2
	-----	-----	-----	-----
	315.4	82	88.3	421.2
	-----	-----	-----	-----

Appendix X b: GIORDANO INTERNATIONAL LIMITED : HKD0.05

GEOGRAPHICAL ANALYSIS

Geographical Analysis-- Turnover by source

	31-Dec 1995 HK\$m	31-Dec 1996 HK\$m	31-Dec 1997 HK\$m	31-Dec 1998 HK\$m	31-Dec 1999 HK\$m
USA	15.8	29.5	10.6	47.5	11.1
Middle East	15.9	29.6	47.3	43.5	54.3
Japan	290.6	312.1	156.5	150.8	82.8
Singapore	361.4	351	284.5	233.5	349.2
Hong Kong	972.4	936.2	794.9	652.6	771
Malaysia	34.2	45	38.3	39.7	77.8
Thailand	32.7	44	-	13.1	21
Philippines	53.4	85.8	91.2	70.6	35.8
Korea	69.6	138.6	190.8	92.6	154.2
Taiwan	1,062.70	917	753.2	710.1	953.1
P.R. China	529.1	570.4	576	517.8	545.8
Others	18.9	35.1	71.2	37.3	35.8
Macau	25.4	27.8	-	-	-
	-----	-----	-----	-----	-----
	3,482.00	3,522.00	3,014.40	2,609.20	3,092.20
	-----	-----	-----	-----	-----

Appendix XI a: VAN SHUNG CHONG HOLDINGS LTD: HKD0.10

BUSINESS ANALYSIS

Business Analysis - Turnover

	31-Mar 1996	31-Mar 1997	31-Mar 1998	31-Mar 1999	31-Mar 2000
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Steel-rebars etc	1,590.00	1,681.00	1,727.90	1,336.60	1,351.10
Plastic resins	221.7	251.8	315.2	319.1	332.7
Processing steel pdts	20.6	48.5	96.3	162.2	158.9
Machinery	13	19.6	6.7	4.9	3.9
Fuel & Oil	-	0.5	-	-	-□
Rental income	-	1	1.8	0.9	0.5
Int inc from finance	-	-	3	0.7	1.3
Sanitary wares & cab	-	-	-	17.9	51.2
Online steel tdg serv	-	-	-	-	1.3
TURNOVER	1,845.40	2,002.50	2,151.00	1,842.30	1,900.90
	-----	-----	-----	-----	-----
	1,845.40	2,002.50	2,151.00	1,842.30	1,900.90
	-----	-----	-----	-----	-----

Appendix XI b: VAN SHUNG CHONG HOLDINGS LTD: HKD0.10

GEOGRAPHICAL ANALYSIS

Geographical Analysis -- Turnover by source

	31-Mar 1996 HK\$m	31-Mar 1997 HK\$m	31-Mar 1998 HK\$m	31-Mar 1999 HK\$m	31-Mar 2000 HK\$m
Hong Kong	1,064.40	1,162.00	1,277.50	1,035.70	1,018.50
P.R. China	681.3	753.1	853.1	760.7	863.6
Macau	-	-	20.4	45.9	18.8
Others	99.7 a	87.3 a	-	-	-
	<u>1,845.40</u>	<u>2,002.50</u>	<u>2,151.00</u>	<u>1,842.30</u>	<u>1,900.90</u>

a) Includes Macau, Vietnam and Singapore

Appendix XII: GLOBAL CHINA TECH GP LTD: HKD0.10

BUSINESS ANALYSIS

Business Analysis - Turnover - Qualified

	31-Mar 1996	31-Mar 1997	31-Mar 1998	31-Mar 1999	31-Mar 2000
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Photographic products	981	1,060.50	1,236.70	882.9	-
AIWA AV products	215.8	195	145.2	18.4	-
Lexicomp products	-	6.6	15.8	0.6	-
MHI air-con systems	56.9	22.1	13	-	-
Audio-visual products	70.4	90.8	57.1	1.9	-
Consumables	-	-	119.1	24.6	-
Computers and telecom	-	-	516.8	66.8	-
Machinery	-	-	113.7	46.1	-
Circuit boards	-	-	34.9	42	-
Joint ventures in PRC	-	-	5.9	-	-
Communication & elect	-	-	-	2.2	-
Misc turnover	52.4	76.1	-	-	-
TURNOVER	1,376.50	1,451.30	2,258.30	1,085.40	597.1 a
	<u>1,376.50</u>	<u>1,451.30</u>	<u>2,258.30</u>	<u>1,085.40</u>	<u>597.1 a</u>

Business Analysis - Profit before tax - Qualified

	31-Mar 1996	31-Mar 1997	31-Mar 1998	31-Mar 1999	31-Mar 2000
	HK\$m	HK\$m	HK\$m	HK\$m	HK\$m
Photographic products	-	-	83.2	-	-
AIWA AV products	-	-	3.7	-	-
Lexicomp products	-	-	*	-	-
MHI air-con systems	-	-	-0.4	-	-
Audio-visual products	-	-	2.1	-	-
Consumables	-	-	2	-	-
Computers & telecom	-	-	10.7	-	-
Machinery	-	-	3	-	-
Circuit boards	-	-	10.2	-	-
Joint ventures in PRC	-	-	0.6	-	-
Admin expenses	-	-	-44	-	-
Exceptional charges	-	-	-10.9	-	-
Assoc cos profit	-	-	*	-	-
Net interest expense	-	-	0.4	-	-
PROFIT BEFORE TAX	-	-	60.7	(59.2)a	(92.0)b
	<u>-</u>	<u>-</u>	<u>60.7</u>	<u>(59.2)a</u>	<u>(92.0)b</u>

a) No available information

b) No available information

*) Details not shown due to rounding

Appendix XIII: TA FU INTERNATIONAL HOLDINGS LTD : USD0.02

BUSINESS ANALYSIS

Business Analysis - Turnover

	31-Dec 1997 US\$m	31-Dec 1998 US\$m	31-Dec 1999 US\$m
Blockboard	45.3	38.3	37.3
Veneer	37.9	13.1	1.5
Plywood	32.2	17.2	6.8
Fancy plywood	18.7	15	12
Machinery & materials	11.1	1.7	6.7
Furniture	6.9	10.5	14.9
Melamine particle	6.3	8.3	3.8
Particle board	4.6	4.5	4.7
Flooring	4.6	5.2	4.2
Medium density fibre	4.4	3.4	3.1
Others	8.9	6.7	3.5
	----- 180.8	----- 124	----- 98.5

Business Analysis - Profit before tax

	31-Dec 1997 US\$m	31-Dec 1998 US\$m	31-Dec 1999 US\$m
Blockboard	9	2.4	5
Veneer	6.4	-2	-0.1
Plywood	-0.2	-4.1	-2.2
Fancy plywood	2	-1.7	-0.9
Machinery & materials	0.8	0.1	-1.3
Furniture	0.6	1.6	2
Melamine particle	2.6	2	1.1
Particle board	1.8	1	0.1
Flooring	0.9	1.2	0.8
Medium density fibre	0.9	-0.1	-0.4
Others	1.1	-1.4	-0.2
Operating Expenses	-25	-49.2	-43.4
Exceptional charges	6.5	*	11.4
Assoc cos profit	1.8	-7.6	-0.9
	----- 9.3	----- -57.8	----- -29

*) Details not shown due to rounding

Appendix XIV a: GOLD PEAK INDUSTRIES, HOLDINGS LTD: HKD0.50

BUSINESS ANALYSIS

Business Analysis - Turnover

	31-Mar 1996 HK\$m	31-Mar 1997 HK\$m	31-Mar 1998 HK\$m	31-Mar 1999 HK\$m	31-Mar 2000 HK\$m
Batteries	1,699.00	1,917.20	500.1	-	-
Electrical & others	818.9	1,001.30	268	-	-
Electronics	968.9	1,037.90	1,416.30	1,152.00	1,159.60
Strategic Invests	18.5	199.1	50.1	55.3	2.1
TURNOVER	3,505.30	4,155.60	2,234.50	1,207.30	1,161.70
	<u>3,505.30</u>	<u>4,155.60</u>	<u>2,234.50</u>	<u>1,207.30</u>	<u>1,161.70</u>

Business Analysis - Profit before tax

	31-Mar 1996 HK\$m	31-Mar 1997 HK\$m	31-Mar 1998 HK\$m	31-Mar 1999 HK\$m	31-Mar 2000 HK\$m
Batteries	122.6	137.2	91.5	-	42.4
Car audio equip	0.0 c	-	-	-	-
Electrical & others	140.2	164.8	106.3	-	48
Electronics	72.6	81.2	87.2	-	508.2
Strategic Invests	35.1	50.1	25	-	-186.7
Exceptional Items	80.6 b	50.7	60.5 b	-	-
Corporate Int & Exps	-54.8	-49	-55.2	-	-51
PROFIT BEFORE TAX	396.4	435	315.4	128.3 a	361
	<u>396.4</u>	<u>435</u>	<u>315.4</u>	<u>128.3 a</u>	<u>361</u>

a) No available information

b) Excludes exceptional provision made in respect of intangible assets held by an associated company

c) Not shown separately

Appendix XIV b: GOLD PEAK INDUSTRIES, HOLDINGS LTD: HKD0.50

GEOGRAPHICAL ANALYSIS

Geographical Analysis= Turnover by source

	31-Mar 1996 HK\$m	31-Mar 1997 HK\$m	31-Mar 1998 HK\$m	31-Mar 1999 HK\$m	31-Mar 2000 HK\$m
Europe	919.1	1,051.30	704.7	376.4	242.6
North & South America	673	621.5	281	256.6	255
Hong Kong	640.6	825.8	243.7	36.4	60.8
P.R. China	313.2	370.4	275.1	97.2	85
Other Asian Countries	783.4	1,060.30	530.6	393.9	478
Others	175.9	226.3	199.4	46.8	40.3
	----- 3,505.30 -----	----- 4,155.60 -----	----- 2,234.50 -----	----- 1,207.30 -----	----- 1,161.70 -----

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