



Hannu Schadewitz

FINANCIAL AND NONFINANCIAL
INFORMATION IN INTERM REPORTS

HELSINKI SCHOOL OF ECONOMICS

ACTA UNIVERSITATIS OECOMICAE HELSINGIENSIS

A-124

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Abstract

This study examines the determinants and implications of the information disclosed in interim reports submitted to the Helsinki Stock Exchange in the period 1985-93. The determinants part of the work is based primarily on prior literature, firm attributes, and the development of the institutional regime. Specifically, nine classes of determinants of disclosure are derived. These are: (1) governance structure, (2) business risk, (3) market risk, (4) capital structure, (5) stock valuation, (6) firm growth, (7) growth potential, (8) firm size, and (9) yearly dichotomy variables representing the legislative climate. Disclosure was measured by two index classes: (1) overall, including both mandatory and voluntary disclosures; and (2) purely voluntary disclosures. The findings show that, besides the year in which an interim report is published, overall disclosure is related to the measures of business risk, growth potential, and firm size. In addition to these four factors, a firm's governance structure is significant in the purely voluntary context.

In the implications part of the study, the markets' assessment of various combinations of unexpected earnings and unexpected levels of disclosure was analyzed via (1) cumulative abnormal returns, (2) earnings response coefficients, and (3) bid-ask spreads. The principal finding is that disclosure enhances the communication of earnings information to the market. This is particularly evidenced when the level of disclosure is as expected.

The results add to the existing understanding of determinants and the use of accounting information in general and intrayear reporting in particular. Besides that, the findings have both managerial and legislative importance.

Key words: Investor communication; Interim reports; Disclosure expectations; Earnings quality; Disclosure index; CAR

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Preliminaries

1. Synopsis and outline of the study

1.1. Synopsis

The corporate form of business organization usually separates ownership from management (Jensen & Meckling, 1976). This induces a principal-agent problem, due to the incongruence of the participants' aims. As a result, the authenticity, degree, and frequency of disclosure of management practices have been a long-standing subject of investigation. Disclosure provides an important means for managers to communicate their superior, firm-specific and potentially industry-specific knowledge to outside investors (Healy & Palepu, 1993, p. 1). Management disclosures in the face of earnings surprises are of interest (Kasznik & Lev, 1995). In addition, financial innovations create new challenges for reporting (Lee, 1992, September). The discretionary reporting environment is found to influence the earnings information that is disclosed by managers (Sivakumar & Waymire, 1993). This is, in part, because the incentive to hide substandard performance exists.

This study has two main research questions:

1. What are the major determinants explaining the financial and nonfinancial information disclosed in interim reports?
2. What are the market consequences of the financial and nonfinancial information disclosed in interim reports?

The first research question is studied in the determinants section of the work and the second in the implications section. The general research questions stated above can be

expressed as testable hypotheses. The hypotheses in the determinants part are as follows:

HD₁: Number of shareholders is positively related to the level of disclosure,

HD₂: Degree of institutional ownership is related to the level of disclosure,

HD₃: Degree of non-institutional ownership is positively related to the level of disclosure,

HD₄: Business risk is positively related to the level of disclosure,

HD₅: Market risk is positively related to the level of disclosure,

HD₆: Capital structure is related to the level of disclosure,

HD₇: Mispricing of a firm's share is positively related to the level of disclosure,

HD₈: Firm growth is positively related to the level of disclosure,

HD₉: Growth potential is positively related to the level of disclosure,

HD₁₀: Firm size is positively related to the level of disclosure, and

HD₁₁: Matureness of market is positively related to the level of disclosure.

In the implications section of the work the hypothesis is as follows:

HI₁: The degree of disclosure has an impact on the market.

A useful feature of *HI₁* is that it links the relation between the market's use of disclosure and the actual disclosure and does so without the need to explicitly specify a particular model for the relationships in question.

This study contributes to existing research in several ways. First, the thorough construction of a disclosure index was performed after an extensive literature review spanning over 30 years and covering both pioneering works and the most recent research.

Second, this study focuses on a very important element of business communication: interim reports. During the research period of 1985-93 interim reporting practices in Finland have undergone enormous change. Therefore the data should contain information relevant to the research questions stated above.

Third, this study extends conventional earnings response coefficient (ERC) research, which limits itself mainly to earnings and its components, in that the study also examines the level and quality of the financial and nonfinancial information disclosed in interim reports. Besides the influence of disclosure on the returns/earnings relationship the study contributes to the literature on post-earnings-announcement drift. There is a wealth of evidence that abnormal returns exist for a short time after earnings announcements (Ball, 1992). Both the database and the design of the present work make it possible to study whether differences in disclosure are related to the post-earnings-announcement drift which has also been reported in the Finnish context (inter alia Schadewitz, 1992).

Fourth, the institutional domain and its development are described for the entire research period of 1985-93 for Finland. In addition, in order to help compare the results with other studies and institutional frameworks, also the development of the institutional regimes for interim reporting in Sweden and the U.S.A. are described.

This should be of interest to those who seek to identify and compare features of disclosure regimes and how those differences affect actual disclosure (see also Frost & Pownall, 1994). Mindful of the regulatory background, two disclosure indices were constructed here: an overall disclosure index, which includes the regulatory developments, and an index of purely voluntary items.

Finally, the interim report database that is constructed should facilitate future research endeavors related to Finnish interim reporting.

Because many of the business communication issues remain unresolved, both researchers and practitioners continue their quest. The Association for Investment Management and Research (AIMR, 1993) addresses such issues as the form, content, and frequency of financial disclosures.

Some findings, however, are generally accepted. Among these is the fact that the annual and interim financial statements are the primary, systematic publications that communicate information to a firm's interest groups. One reason for this is that financial reporting diminishes the information asymmetry problem between managers and all other interest groups.

Expanded public disclosure is of use in reducing the cost of determining corporate value (Porter, 1992, p. 79). It is estimated that information that is reported more often than annually comprises 30 to 40 percent of the total financial communications effort (AIMR, 1992, p. 110). Thus, interim financial statements have become an integral part of corporate management's reporting of stewardship.

Some Finnish firms began to publish interim reports as early as the 1970s. This is many years before regulation made interim reporting standard practice. Interim reports for firms listed on the Helsinki Stock Exchange (HSE) have been mandatory since January 1986. Because interim reporting is a relatively new practice, it offers the prospect of studying the impact of the development of reporting policy in a recent context.

In its search for the appropriate degree of regulation, the HSE has created a fluid reporting environment. Because the regulation has allowed a wide degree of discretionary latitude, the determinants of corporate disclosure strategy can potentially be identified through interim reports. The policies that give rise to the reported results may reasonably be implied from statistical analyses of such results.

This study focuses on both the determinants of disclosure, which are reported in chapter 7, and their implications, which are reported in chapter 8.

Although systematic financial reporting has obvious advantages, some of its side-effects are the subject of critical debate. An example of such debate is the fact that certain groups are calling for corporate disclosure to be curbed. It is their hope to extend the investment horizon by providing information no more often than the required annual reports. It is argued that the abolition of interim financial reports might lengthen investors' investment horizons (Porter, 1992, p. 76).

A related argument for the abolition of interim financial reports is that their existence may induce myopic behavior by managers. For example, in trying to maximize

short-term earnings-based bonuses, a manager might concentrate on current-period earnings, at the expense of the firm's longer-term development.

The growing number of interim financial reports published by firms listed on the HSE provide a database for the investigation of the impact of varying corporate disclosure policies. Some of these policies are a direct response to regulation, while others may be viewed as an indirect response to the context of current and expected regulation. Seven of the specific factors affecting Finnish interim disclosure are listed below.

First, the information content of interim reports is increasingly comprehensive. This research attempts to determine whether this tendency is due entirely to regulatory requirements or whether there is an autonomous increase in voluntary disclosure in interim reports. Dye (1986) develops theoretically established conditions in which increasing mandatory reporting requirements increase corporate incentives for voluntary disclosure.

Second, interim financial statement regulations offer firms alternative interim reporting periods. A firm can, for example, choose to publish one report after a six-month period or two reports: one after four months and another after eight months. The choice of reporting periods might be influenced by a mixture of: (1) general economic, (2) industry-specific, and (3) firm-specific factors. Highly seasonal operations, for instance, might be better communicated to interest groups by applying the interim results of the four-month/eight-month reporting option.

Third, there are no known Finnish contracts in which managerial remuneration is based on interim results. The absence of such explicit contracts offers the prospect of greater managerial objectivity in interim reporting as compared to annual reporting.

Fourth, dividends and taxes are calculated on a firm's annual earnings. No second set of books is kept for tax purposes, as is the case in several other countries. Without direct dividend or tax consequences, managers may objectively report the firm's actual operating results in interim financial statements.

Fifth, a firm quoted on another stock exchange is allowed to submit its interim report according to international accounting standards, if that standard is approved by the other stock exchange. This flexibility offers firms quoted on another stock exchange three alternative accounting standards in their domestic interim reports: (1) Finnish accounting (FA) standards, (2) international accounting (IA) standards, or (3) both FA and IA standards. The accounting standard that a corporate applies in its domestic interim report may indicate managers' intentions in terms of targeting particular interest groups. All of the three alternatives (FA alone, IA alone, both FA and IA) are in fact used in Finnish interim reports (Adams, Weetman, & Gray, 1993).

Sixth, sometimes corporations publish interim reports subject to the examination of the company's auditors. Management's decisions vis-à-vis the choice of the release of audited interim reports is an interesting topic for investigation, subsequent to this research.

Finally, in Finland, corporations typically announce preliminary annual results. Therefore, much of the information content of the final annual report is anticipated before its announcement. With interim reports the practice is opposite. There is virtually no pre-announcement of interim reports (Schadewitz & Vieru, 1993, p. 12). The nonexistence of preliminary announcements of interim results gives interim reports a somewhat different position relative to that occupied by annual reports. Interim results have the potential to contain new, previously unpublished, information. This point stresses the importance of the content of every single interim report.

This study investigates the major determinants and implications of the information disclosed in interim reports. From a determinants perspective, it is hypothesized that the level of disclosure is a function of a firm's: (1) governance structure, (2) business risk, (3) market risk, (4) capital structure, (5) mispricing, (6) growth, (7) growth potential, (8) size, and (9) market maturity. From an implications viewpoint, it is assumed that the markets' assessment of unexpected interim earnings (forecast based on a seasonal random walk model) and purely voluntary disclosure is reflected in: (1) cumulative abnormal returns, (2) earnings response coefficients, and (3) bid-ask spreads. The forecast for purely voluntary disclosure is based both on the determinants of disclosure and the voluntary disclosure in the preceding interim report.

The determinants of overall disclosure in interim reports include both the mandatory portion and information that is reported voluntarily. Overall disclosure is directly related to quantitative measures of: (1) business risk, (2) growth potential, and (3) firm size. Moreover, during the research period 1985 through 1993, the development of the quality of interim reports has been rapid, paralleling the expansion of accounting and

market regulation. This explains why the year is a significant determinant of accounting disclosure here.

Most of the determinants of voluntary disclosure in interim reports are the same as those for the overall disclosure. Just as the year is a significant determinant of overall disclosure, it is an important explanatory variable for voluntary disclosure as well. This indicates that firms are willing to submit voluntary information, in addition to the mandatory items, in their interim reports. The number of shareholders is a measure of the governance structure. It is a significant determinant of the voluntary, but not of the overall, disclosure model.

In the implications part of the study the principal finding is that in particular disclosures that do not contain large surprises assist the communication of earnings information to the market.

1.2. Outline of the study

This study has three major parts after these *Preliminaries*. *Part one* contains the underlying theory and explains the institutional setting. This discussion lays the foundation for the following two parts. *Part two* presents the empirical evidence. Conclusions are drawn and recommendations are offered in *Part three* of the study.

Part one consists of four chapters, which aim to show that, although a securities market might be efficient, there is the possibility that information asymmetries between managers and outside interest groups exist. Chapter 2 reviews the relationship between accounting information and the capital markets. Prior research,

related to interim reports and to the development of disclosure studies over a 30-year time span, is presented in chapter 3. The institutional environment surrounding interim reporting is covered in chapter 4. This chapter contains a comparison of Finnish regulation with that in both Sweden and the United States. Chapter 5 sets out the specific hypotheses to be tested in this research.

Part two presents the empirical evidence. This part follows the conventional order of research. Chapter 6 details the data sources used in this research. Chapter 7 presents the rationale and basis for the selection of the set of disclosure items deemed to provide valuable information for a firm's outside interest groups. Furthermore, chapter 7 contains a measurement of the use of these determinants in interim reports. Chapter 8 discusses the market implications associated with the publication of interim reports.

Part three concludes. This single chapter contains a summary of the study. In addition, conclusions from: (1) the theoretical, (2) the managerial, and (3) the legislative perspectives are drawn. Finally, some suggestions for further research are given.

Part one

Theory and institutional setting

2. Corporate communication to the capital markets

2.1. Information asymmetries in the capital markets

This chapter builds the foundation for the more specific research to follow. An essential part of financial accounting is a firm's communication to outside interest groups, especially to the capital markets. In efficient capital markets, this information is immediately and correctly reflected in prices. Fama (1976, p. 133) defines efficient capital markets as follows:

An efficient capital market is a market that is efficient in processing information. The prices of securities observed at any time are based on "correct" evaluation of all information available at that time. In an efficient market, prices "fully reflect" available information.

The efficient market concept can be further categorized into three, more operationalized, levels (Fama, 1970, p. 383): (1) weak form efficiency, (2) semi-strong form efficiency, and (3) strong form efficiency. Weak form efficiency prevails when any information contained in an historic price series is reflected in the current price. Semi-strong efficiency prevails when all publicly available information is reflected in a security's price. Strong form efficiency exists when all information, public and private, is reflected in the current price (Dyckman & Morse, 1986, p. 5). Fama (1991) provides a review of the first two decades of market efficiency literature.

With respect to semi-strong efficiency, financial reporting provides one public information source to the market. Research thus far reports the existence of certain systematic inefficiencies. Markets appear unable to take immediate advantage of all

the available information in investment decision-making. There is consistent evidence that abnormal returns exist for a short time after earnings announcements (Ball, 1992). One of the findings is that a substantial proportion of post-announcement drift is delayed until earnings announcements in subsequent quarters (Bernard & Thomas, 1990). This is a significant finding in that it suggests some sort of market inefficiency. Recently Ball and Bartov (1996) provided further explanation for this market anomaly. Interestingly, besides confirming previous findings, they also report that the market acts as if it underestimates the magnitude of the serial correlation in unexpected earnings by about 50%.

In addition to a slower-than-immediate adjustment to unexpected information, information asymmetries between managers and investors appear to exist. Myers and Majluf (1984) suggest that managers know more about the firm's value than do its potential investors. This study was seminal for the subsequent focus of research in the field. Furthermore, the separation of ownership, inherent in the corporate form of business organization, can lead to incentive problems. This is analogous to the "lemons" (low quality car) problem in the used car market discussed by Akerlof (1970). He discusses the problems of quality and uncertainty. This separation means that decision agents do not often bear a substantial share of the effects on wealth that result from their decisions. As a consequence of this combination of information asymmetry and goal incongruence, managers are tempted to make decisions which further their personal interests rather than those of their employers (Fama & Jensen, 1983, p. 301). One practical result is that not all projects with positive net present values will be accepted by the firm, as is hypothesized in classical financial theory.

Financial reporting can be used to narrow the undesirable information asymmetry, and to facilitate the disclosure of events and transactions in which managers behave in a manner that is not in the best interest of the owners. However, financial reporting is not yet the complete solution. In addition, it is argued that there is a misalignment of management and shareholder interests, and that accounting rules and auditing practices are imperfect (Healy & Palepu, 1993, p. 2). As long as the record-keeping and control functions are unable to disclose adequate information regarding the existence, value, and use of resources, the sources of capital available to firms will continue to be affected. Lack of information may, for example, dissuade capital market investors. This, in turn, may cause the shares of a firm to be undervalued, due to the resulting decline in the demand for its shares. If a firm's shares are undervalued, it might turn to conventional loan finance rather than the capital markets. This alternative market might provide a better forum for adequate communication by the firm with its suppliers of capital.

Healy and Palepu (1995) examine and offer important insights into aspects of investor communication based on the experience of CUC International, Inc. The firm faced difficulties in convincing a wide spectrum of investors of the profitability of its marketing efforts. CUC's managers thought that the stock was undervalued, a situation that could even have increased the threat of a hostile takeover by an informed investor. The managers responded to the communication problem with accounting releases backed up by financial action. The authors conclude that much remains to be learned about the communication of information (*op. cit.*, pp. 138-139):

The CUC [CUC International, Inc.] case raises a number of questions, suggesting that information communication between corporations and

outside investors is potentially a rich topic for further research. While mandated disclosures through audited financial reports and financial policy decisions can help managers communicate with investors, they do not fully resolve the challenges. A complete understanding of shareholder communication challenges, therefore, involves studying issues such as the costs and benefits of going public, voluntary disclosures, and relationship financing.

Lev (1988) calls for efficient accounting policy in order to reduce information asymmetries between investors. The perspective on accounting should be broader than just, say, accounting for stewardship (Gjesdal, 1981). Asymmetries in the markets can lead to high transaction costs, thin markets, lower liquidity of securities, and lower trading profits. This argument for more efficient accounting policy is not designed to favor or defend a specific group of investors. Rather, it is intended to benefit all market participants (Lev, 1988, p. 19).

Hakansson (1990, p. 51) argues that one essential element in the reduction of predisclosure search and spillover activities would be to narrow the window between the occurrence of an important event in a firm and its publication. This important insight suggests the great benefit of interim reporting (see appendix E for reporting lags).

2.2. Disclosures in the face of information asymmetries

Prior research shows fairly decisively that earnings contain information that is useful to the markets. Yet earnings are found to have only limited ability to explain market behavior in either the event sense or in the association sense. For these reasons,

researchers continue to search for more insight into the communication gap between managers and outside interest groups.

Lev (1989, pp. 155-156) points out in his review article the limited understanding of low returns-earnings associations. He calls for a reexamination of the returns-earnings paradigm:

While current research largely takes reported financial variables at face value and focuses on methodological issues, a departure in the direction of emphasizing accounting issues and in particular the quality of reported information appears promising. The proposed research agenda focuses on two broad issues. The first (positive) one calls for investigating the process of financial information dissemination in capital markets. In particular, this research is aimed at understanding the actual use of reported data by investors (i.e., the process of financial statement analysis). The second, a policy-oriented research agenda, focuses on possible improvements in accounting measurement and valuation techniques which affect the ability of earnings and other financial items to facilitate the prediction of investor cash flows.

In addition, there are ongoing efforts to obtain more insight into the efficacy of accounting information other than earnings. However, the theory so far offers only limited explanation of how accounting information is either selected for disclosure or is used.

Researchers are constantly studying the production and use of accounting information. There is a continuous need to understand how financial reporting might be improved, expanded, or refined. The precise implications of changes in the timeliness or

frequency of reports and the reporting horizon, or in what is reported, are not totally understood.

The information gap between managers and the users of disclosed information was addressed in the mid-1970s in a series of studies (Lee & Tweedie, 1975a, 1975b, 1976). They report that users have a limited understanding of accounting information. Interim reports are said to be of only moderate to slight importance to users (Lee & Tweedie, 1975a, p. 288). Among other things, the onus on accountants to publish reports containing information that can be understood by its recipients is stressed (Lee & Tweedie, 1976, p. 314). Based on U.S. data, Chandra and Greenball (1977) report that management assigns a lower information value to some requested items than do investors. Lev and Ohlson (1982, p. 251) continue by saying that market-based research in accounting should be utilitarian in nature. Therefore, research findings, some parts of them, or some of their derivatives, should be useful to firms and their interest groups. Good research should be able to enhance this understanding.

In Finland, results similar to those presented by Lee and Tweedie (see above) have been reported. Havunen and Yli-Olli (1986, p. 53) find that, although financial information is useful for investors in decision-making, there is a deficiency in shareholder understanding. This implies that financial reports fail to adequately address the information needs of individual investors. Among the improvements that should be considered are better and more timely dissemination of information by firms and the further development of both intra- and inter-year reporting (Havunen & Yli-Olli, 1986, p. 53).

Ikäheimo (1991) studies shareholders' use of information in the Finnish context. His research is based on a field study. Fifteen shareholders are interviewed. It is found that both the size of the portfolio and the investment style are related to the usage of information.

Recently, Puttonen and Kasanen (1995) analyzed the investor relation practice of the HSE-listed firms. This questionnaire survey was directed at financial analysts. They received 34 responses, implying a 53.0% response rate (op. cit., p. 28). The authors found that the quality of business communication between firms differs a lot. The leading communicators are said to be large international firms (op. cit., p. 4). The investor relations index (IR index) indicates how, on average, financial analysts divide their time between eight different aspects of business communication. Annual and interim reports are clearly the two single most important sources of information as measured by the use of time. The average proportion of time spent analyzing annual and interim financial statements is 17.0% and 16.0% respectively (op. cit., p. 27).

2.2.1. Theoretical developments

One route to greater understanding of the impact of disclosure is theoretical. Some theoretical studies are reviewed here to indicate both the multidimensionality and the high degree of complexity associated with firms' communication with outside interest groups. These normative works serve as a backdrop for the empirical portion of the present study. The findings reported in this monograph may contribute to further theoretical work. Theoretical studies tend to center on determining the appropriate degree of disclosure, given: (1) specific situations and (2) explicit assumptions. Both the situations and the assumptions in these studies are hypothesized. Previous studies

may be broadly characterized under the following headings: (1) governance structure, (2) business risk, (3) market risk, (4) capital structure, (5) stock valuation, (6) firm growth, (7) growth potential, and (8) firm size. Some of these theoretical categories are identified in Lev (1969), when he propounds the informational analysis of financial statements as a course for future research (op. cit., pp. 67-68).

2.2.1.1. Governance structure

A firm's ownership structure may reflect the level of sophistication of its various owners. The communication between the firm and its owners may also differ depending on matters such as the ownership structure and the composition of the board.

Dye (1986) investigates the distinctions between proprietary and nonproprietary disclosures. Proprietary disclosures are defined as reducing the present value of a firm's cash flows. Especially interesting is his analysis of the impact of mandatory disclosure on voluntary disclosure. More specifically, the issue is how the mandating of disclosure affects voluntary disclosure. Theoretically, the mandating of disclosure increases the incentive for voluntary disclosure. As a corollary, low voluntary disclosure may increase the need for more mandatory disclosure. Dye concedes that his conclusions regarding disclosure policy are dependent on a certain hypothesis of investor knowledge prior to actual disclosure announcements (op. cit., p. 347).

Kim and Verrecchia (1994) study earnings announcements by admitting the likelihood that certain traders make superior judgments to other traders. One important finding is that, with certain assumptions, earnings announcements generate even more

information asymmetry than that which existed prior to the announcement. This can occur if earnings announcements provide information that allows certain traders to make superior judgments about a firm compared to other traders.

The present study assumes that a firm's governance structure is one of the factors affecting the firm's level of disclosure in interim reports. Besides the number of shareholders, potential variations in the sophistication of different parties is accounted for by separating institutional and non-institutional owners. In addition, part of this study focuses solely on voluntary disclosure in interim reports by HSE-listed firms over the period 1985-93. This is designed to indicate how the increased regulation and legislation of interim reporting have influenced voluntary disclosure over the period.

2.2.1.2. Business risk

A firm's cash flows can be considerably affected by its level of business risk. It is important for a firm to provide accurate information on the risks involved in its business operations.

Dye (1990) investigates the effect that two kinds of externalities have on disclosure. If a disclosure by one firm alters another firm's cash flows, the externality is said to be real. The announcement of a research breakthrough or the revelation of trade secrets are examples of real externalities. This is because competitors can experience actual negative cash flow changes as a result of such an announcement (op. cit., p. 2). Financial externalities are said to exist when disclosure by one firm has the potential to alter investor perceptions of the magnitude or variability of another firm's cash flows. It has been suggested by Dye that the optimal balance between voluntary and

mandatory disclosures is dependent upon the form of externality that the firm's disclosure generates. In the present study a firm's business risk represents one type of externality that can affect firms' (including its own) cash flows. In particular, the study investigates whether different levels of business risk in a firm's activities influence its disclosure behavior in its interim reports.

Wagenhofer (1990) studies the effect of the existence of a strategic opponent on a firm's voluntary disclosure. He tries to identify the trade-offs faced by a firm possessing superior information about itself and competing with an opponent in a financial market. The trade-offs involve the firm's decision to disclose the superior information. The firm has to consider the market price of its shares and the proprietary costs it must bear in response to the reaction of its opponent to its disclosure. The present research indirectly measures the impact of such influences as externalities via their impact on business risk and especially how business risk affects to disclosure. In addition, purely voluntary disclosure in interim reports is studied separately by extracting it from the overall level of disclosure.

2.2.1.3. Market risk

Firms may operate in very different business environments. In particular, the market risks involved may vary considerably depending on the type of business. Firms operating in high-risk sectors may need to observe an expanded disclosure regime compared to firms operating in lower risk environments.

Diamond (1985) attempts to determine a firm's optimal information release policy. In particular, his focus is on how a firm's disclosure policy affects investors'

information-gathering task in respect of a firm. He demonstrates that a firm can have an optimal policy of disclosure of information that can make its shareholders better off due to information cost savings and improved risk-sharing. The present study attempts to identify how firms' disclosure policy in interim reports is affected by the differences in market risk among the sample firms. The results obtained should offer empirical evidence of the optimal disclosure policy in interim reports at varying market risk levels.

2.2.1.4. Capital structure

A firm's sources of capital could also influence its disclosure policies. Debt financing and debt reduction plans are based on formal written contracts. Lenders normally gain access to privileged information in order to convince themselves of a borrower's ability to repay the loan. Equity financing and firms' compensation to shareholders are based mainly on dividends. The performance of a firm, especially the level of earnings, has an important impact on the amount of dividends paid out.

Kim and Verrecchia (1991) provide insight into anticipated announcements and study how the anticipation of a forthcoming announcement affects investors' private information-gathering. In particular, the anticipated precision of the public announcement is examined. The precision (inverse of variance) refers to the random error in future public disclosure (op. cit., p. 274). They find that between two extremes (the precision of the public announcement is either small or extremely large), the impact of the public announcement is sufficiently large and creates incentives for investors to acquire alternative information. The present study examines empirically

whether the degree of unexpectedness in disclosure influences the market's use of interim reports.

McNichols and Trueman (1994) also demonstrate that public disclosure stimulates private information acquisition. In their research setting they allow traders to acquire and trade on private information prior to a public disclosure (op. cit., p. 70). Specifically, they show that the greater the probability or the precision of a public disclosure, the more thorough is the information gathered by the informed trader during the pre-announcement period. In the present work pre-event return measurement periods are also applied in order to capture possible pre-event information-gathering.

Teoh and Hwang (1991) present a model where, contrary to the usual scenario, some firms may voluntarily withhold good news and disclose bad news. This is said to be one way for high-quality firms to distinguish themselves from low-quality firms. Indjejikian (1991) examines how investor ability/sophistication influences a firm's disclosure decisions. In equilibrium, it is found that the information disclosed increases as investors become less sophisticated. In addition, a high level disclosure may trigger investors' search for and interpretation of alternative sources of information instead of the use of common sources of data, such as price. This, in turn, decreases market consensus and potentially improves investor welfare.

The present research measures the influence of such information asymmetry, among other things, via a capital structure variable. The greater the information asymmetry,

the less inclined investors will be to buy stock and the more the firms will have to rely on borrowing.

2.2.1.5. Stock valuation

Stock prices reflect, among other things, the ability of firms to generate earnings. The better a firm can communicate its potential, the closer share prices should also reflect this.

Dontoh (1989) investigates the incentives for firms to voluntarily disclose information about future outcomes. In the research design disclosure costs are determined endogenously. The paper provides possible explanations for why value-maximizing firms voluntarily disclose unfavorable news. One of the findings is that the level of endogenous disclosure costs and gains depends on the intraindustry information transfers and the resulting reaction by the firm's competitors (op. cit., p. 505). In the current study the proposition is that potential misvaluation of a firm's share will lead to extended disclosure even in the event of unfavorable news in order to avoid high litigation costs when bad news is purposefully withheld.

Holthausen and Verrecchia (1990) examine the effect of *informedness* and *consensus* on price and volume. The term informedness refers to the degree to which recipients become more knowledgeable at the time of an information release. The term consensus refers to the degree of agreement among recipients at the time of an information release (op. cit., p. 192). The authors argue that informedness and consensus effects occur jointly and exercise an influence over price and trading volume. Their study supports the relevance of further research focusing on either: (1)

unexpected price changes or (2) unexpected changes in trading volume. In the present study unexpected returns reflect the information content of disclosure and earnings to the markets.

Demski and Feltham (1994) study market responses to financial reports in a two-date theoretical model. They find that price changes on a public reporting date are linked, among other things, to the precision of the publicly known information about the future value of the firm and to the extent to which prior information is discounted in prior prices. The present study analyzes the influence of disclosure and earnings on unexpected price changes. Furthermore, the pre-announcement return measurement periods are applied in order to capture the pre-event information already discounted in prices.

2.2.1.6. Firm growth

The growth of a firm can be seen both as an opportunity and as a threat to its shareholders. Growth could cause an increasing information asymmetry between managers and markets if that growth or the direction of it are not adequately explained in disclosures. Among other things it is important for the markets to evaluate the growth horizon. Management can use voluntary disclosure to demonstrate their skill in predicting the future.

Trueman (1986) offers an explanation for voluntary disclosures of earnings forecasts. The background to the paper is his observation that, although a firm must announce earnings at the end of a period, some firms seem to announce forecasts of earnings during the period. Trueman argues that the central reason for voluntary forecasts is

management's willingness to indicate its ability to anticipate: (1) future changes and (2) how those changes will affect the firm's earnings. Management's ability to anticipate future earnings is valuable for investors irrespective of whether the expectation is of favorable or unfavorable news. An average positive price change is observed at the time of earnings forecast releases (op. cit., p. 70). However, the costs associated with the preparation and release of earnings forecasts decrease the incentives for such disclosures. The empirical results of unanticipated positive or negative earnings reported in the present study provide some explanation of the willingness of managers to publish forecasts of earnings.

2.2.1.7. Growth potential

Growth potential would normally be expected to cause expanded disclosure, but this is not always necessarily the case. Verrecchia (1983) shows that, theoretically, managers exercise discretion in their disclosure behavior. One of the premises is that traders are aware of the existence, but not the content, of the information possessed by managers. An interesting conclusion is that managers may occasionally withhold some good news as well as bad news. An example is a variety of favorable accounting statistics that have the potential to foster harmful effects when misunderstood by the investor. Verrecchia (1990) extends his 1983 work by showing how information quality affects disclosure. In general, he shows that when managers possess high quality information it is likely to be passed on in the form of increased disclosure.

Chen (1994) postulates that the apparent short-term orientation of firms that do not reveal favorable information is due to the fact that their competitors might benefit in the longer term from that information. For instance, the disclosure of investment

opportunities, technological expertise, or business plans may have a negative impact on the firm in terms of competing in its product market (op. cit., p. 212).

Penno (1996) studies the significance of precision choices in financial reporting. He shows theoretically that managers' incentives to produce more precise information are a function of the firm's future prospects. Specifically, firms with poor (good) prospects choose more (less) precise disclosures. He calls disclosure with high precision *back-to-the-wall* policy, where initially unfavorable news is followed up by an extensive output of information. Disclosure with low precision is viewed as a *don't-rock-the-boat* policy, where good initial news is not followed up by an extensive output of information.

The present study addresses empirically the discretionary disclosure issue. In particular, the market consequences of different levels of disclosure quality in interim reports are examined by including variables related to growth potential. These provide new insight into how growth potential and disclosure are related.

2.2.1.8. Firm size

The size of a firm may also influence the degree to which its operations can be comprehend by outsiders. The operations of a large multinational company will contain elements rarely found in a small domestic firm. The size of the interested public and their reasons for being interested will be very different for different sizes of firms.

Newman and Sansing (1993) prove that the presence of multiple users with conflicting objectives can affect the degree of information that a firm discloses. The larger the firm, the larger is usually the interested public. The current study also includes the firm's size as one potential explanatory variable for the degree of disclosure in interim reports.

In addition to theoretically based models, empirical disclosure studies are reported in literature. One recent focus is on the attempt to better understand manager incentives to voluntarily disclose news which is conventionally interpreted as unfavorable for the firm. One common explanation for the open communication of bad news is that managers wish to systematically build up long-run confidence in their investors.

Some recent studies focusing on actual disclosure behavior and emphasizing single information items are introduced briefly below.

2.2.2. Some evidence of discretionary disclosures

Empirical studies recognize some of the difficulties related to financial reporting. Radebaugh and Gray (1993, p. 195) find that the cost of competitive disadvantage is ranked as the number one factor constraining voluntary information disclosure by executives in the U.K. and the U.S. However, although this type of finding is prevalent, there are some recently reported exceptions. Harris (1994) studies whether competition has any impact on managers' reporting of business segment information. Interestingly, she finds that the likelihood of segment reporting increases with greater intraindustry competition (op. cit., p. 73). The finding supports the view that disclosure costs are lower in highly competitive industries than they are in less

competitive industries. In addition, one reason why firms are reluctant to disclose segment information in noncompetitive industries is said to be the protection of profits (op. cit., p. 73).

One influential branch of research is positive accounting research, focusing on the contractual relationships between parties associated with a firm and the role of accounting in that context. Important studies within this research direction are Watts and Zimmerman (1978) and (1990). However, hypotheses derived from positive accounting research have only partially succeeded in explaining managers' accounting decisions (Bromwich, 1992, pp. 321-328).

Recently some important insights have been gained into managers' disclosure practises. For example, knowledge of the voluntary disclosure of bad news has improved. An important work in this area is Skinner (1994). He analyzes corporate earnings-related disclosure practices in a random sample of 93 NASDAQ firms between 1981 and 1990. The main findings are as follows: (1) earnings-related voluntary disclosures occur infrequently; (2) there is a tendency for good news to be reported as a point or range of annual earnings per share, while bad news disclosures tend to be qualitative statements about the current quarter's earnings; and (3) the stock price response to bad news disclosures is greater than to good news disclosures. In addition, large quarterly negative earnings surprises are preempted 25 percent of the time by voluntary firm disclosures (op. cit., p. 39). That frequency is higher than that of other earnings announcements, which are preempted less than 10 percent of the time. The explanation for voluntary bad news disclosure is said to be related to managers' asymmetric loss function. The results give indirect evidence that managers

incur high costs from the concealment of bad news. Two reasons for this are stated (op. cit., p. 39): (1) shareholders may sue due to large stock price declines on earnings announcement days and (2) managers may lose their reputation due to their failure to disclose bad news in a timely manner. Similar results are reported in Kasznik and Lev (1995).

Theoretical developments, underpinned by empirical results, indicate the multidimensional nature of disclosure development (see also appendix A). It seems that the trend is toward more transparent and long-run disclosure strategies. This satisfies investor needs more fully than was true with earlier practices. The trend toward more integrated disclosure strategies is recognized in literature. Lev (1992, p. 28) summarizes some of the key aspects that are reviewed in section 2 in this study and concludes as follows:

Given that without an active, long-term disclosure strategy, there is no assurance that the full value of the firm's other activities will be fully reflected in a timely manner in the various markets in which it operates, the need for a disclosure strategy arises. A disclosure strategy should be of particular interest to top management, since disclosure is among the few corporate activities practiced directly by executives, as contrasted with most other activities which are delegated to subordinates.

Chapter 3 continues the literature review. One important element in a firm's business communication is interim reports. Therefore, studies involving interim reporting are given special emphasis in the next chapter.

3. Survey of prior studies of interim reporting

This literature survey continues to build on the foundation laid in the previous chapter. The first part of this survey focuses on studies based on interim reports. The main objective of the interim reporting section is to differentiate between what is known and what remains to be discovered about interim reporting. The information in this section leads to the empirical part of this study.

The second section of this literature survey focuses on a principal method of quantifying disclosed information - disclosure index studies. The major studies published between 1961-95 are summarized briefly. A special effort is made to identify potential deficiencies in previous studies. Lessons and findings from prior literature led to the construction of a new disclosure index, which is employed in the present work.

3.1. Causes and consequences of interim reporting

This section reviews the general level of accumulated knowledge related to interim reports. The aim is to provide the reader with a background to interim reporting issues. This background will demonstrate why interim reports are an important research topic. Recent literature supports the value of frequent reporting, but also recognizes the difficulties associated with it. There is a strong belief that quarterly reporting by public companies should be retained. Three reasons for quarterly reporting are stated by the American Institute of Certified Public Accountants (AICPA, 1994, p. 25). These are summarized below:

1. quarterly reporting helps users to have a longer-term focus,
2. quarterly reporting provides for an orderly dissemination of reliable information, and
3. quarterly reporting reduces problems associated with insider trading.

Some discussions even suggest that quarterly reporting has an impact on the volume of trading (Porter, 1992, p. 76).

The first subsection of this review is organized under the following topics: (1) reporting frequency, (2) the relationship of interim and annual reports, (3) time-series evidence related to interim earnings, (4) the relationship between interim earnings and the stock markets, and (5) a concluding subsection. This organizational structure follows a logical flow. Reporting frequency is a function of a combination of the response to regulation and a voluntary desire to communicate with investor groups. This leads to the existence of interim reporting. The interaction of interim and annual reports is, therefore, the first relationship reviewed after the section on reporting frequency. The order in which each subsection progresses is mostly based on the date of publication time of the works cited.

3.1.1. Reporting frequency

Interim financial statements are an integral part of the financial reporting process. Interim statements provide a theoretically efficient channel for the enhancement of the information flow to parties interested in the results of a firm's operations. A trade-off exists, however, between the benefits and the costs of such reporting.

Continuous reporting would provide the market with the greatest amount of information. There would be few surprises, because all market participants would be informed of events and transactions as they occur. With perfect visibility, the accounting system would be a continuous and error-free source of complete and perfect information to its users (Walker, 1973, p. 23). Continuous reporting does not exist in practice. Among other things, continuous reporting would require the rapid reporting of decisions made at all levels of an organization, even before the financial impact of such decisions is felt. An additional cost would be that associated with the loss of secrecy to third parties which is inherent in detailed disclosure.

At the other practical extreme is reporting once per fiscal year. Such a system would have the merit of preserving organizational secrecy for as long as reasonably possible, in addition to the relatively low cost of producing just one report per period. The price to be paid would be increased information asymmetry in the market place vis-à-vis the firm's management. If events and transactions are reported only once per year, much of the report will be a surprise to the user.

It is to be expected that market participants seek to balance the benefit-cost relationship associated with report frequency. Firms that report too often would be penalized for the high cost of providing the information. Firms that report too infrequently would be penalized for the unnecessary information asymmetry that their failure to report would generate. There would be rewards, however, for those firms that optimize reporting frequency. Of course, firms cannot always decide the frequency of their reporting, due to the existence of regulatory requirements. Chapter

4 presents current practice relating to reporting frequency in both a regulated and a voluntary environment.

The literature survey of this subsection begins with an institutional setting in which the publication of interim reports is voluntary. The order of presentation is determined by the chronological sequencing of the periods investigated in the articles.

The earliest of the periods studied is that reported by Morris (1984). He studies disclosure in a substantially unregulated environment: New South Wales during the second half of the nineteenth century. One interesting finding in the study is that firms listed on the Sydney Stock Exchange published half-year reports more frequently than annual reports during the period 1851-90. A majority of listed firms disclosed: (1) a director's reports, (2) audited balance sheets, and (3) audited profit and loss accounts. The author concludes that most of these disclosure practices seem to have been set by market forces.

The theme in Leftwich, Watts, and Zimmerman (1981) is closely related to the present work. They provide evidence of managers having an incentive to supply interim reports voluntarily. Their intention is to explain the existence of interim reports as a monitoring device. The research period is 1937-48. They find that NYSE-listed firms reported more frequently than firms listed on the ASE. The 1937 reporting behavior of NYSE firms tends to persist as late as 1948, and there is not much relationship between the frequency of interim reports and the determinants of monitoring. However, agency theory and team monitoring are not refined enough to allow unambiguous predictions on the basis of the detailed variables suggested by Leftwich

et al. (Schipper, 1981, p. 88). There has also been a suggestion to replicate the study by Leftwich et al. in European countries with more current data (Burton, 1981, p. 83).

There are also more recent studies based on voluntary semiannual earnings disclosure practices in non-U.S. markets. If evidence from other markets confirms previous findings, the global validity of the results will improve. Bradbury (1992) examines the topic in New Zealand institutional setting. He tries to explain voluntary semiannual earnings disclosures, both quantified and unquantified, by: (1) earnings volatility, (2) unexpected earnings, and (3) firm size. The period covered is 1973-76, when the content of semiannual disclosures by firms listed on the New Zealand Stock Exchange was unregulated. The results suggest three things. One, there is no association between the level of voluntary semiannual earnings disclosures and annual earnings volatility, or that the relation is uncorrelated due to opposing effects. Two, firms with larger annual forecast errors have more nonquantified interim disclosures. Three, firm size does not affect the level of disclosure. Differences between these results and those found in prior research are judged to result from the thinness of the New Zealand capital market. These factors might have enhanced the role of indirect channels of corporate disclosure over the period studied.

3.1.2. Linkage between interim and annual reports

One elementary topic in interim reporting research is the relationship between interim and annual reports. Variations in this relationship may also be a reflection of the type of information disclosed in the different reports. Two basic, competing, views of this relationship are given by Foster (1986, p. 222): (1) the discrete view and (2) the integral view. Some earlier discussions also touch on this matter (Bollom, 1973;

Bollom & Weygandt, 1972; Bows & Wyatt, 1973; Sprague, 1975; Van Pelt, 1970; Walker, 1973), as do some more recent articles (Courtis, 1987; Nurnberg, 1988). The issue remains unresolved.

In the discrete view, each interim period is considered independent (Foster, 1986, p. 223). Sales and expenses occurring during the interim period are also reported as such. In the discrete approach, the emphasis is on the actual achievement of the interim period (Fried & Livnat, 1981, p. 493). Users of interim reports are assumed to monitor a firm's performance exclusively for the reported period. One danger associated with this view is the fact that the data can contain biases, such as those caused by seasonal operations. A classic study on this subject is Foster (1977).

In the integral view, every interim period is considered an integral part of the reporting year (Foster, 1986, p. 222). In this view, the emphasis is on providing information to users as an estimation of annual results (Fried & Livnat, 1981, p. 493).

Current literature indicates that neither of these views is demonstrably superior to the other. In Canada, a compromise combination of these two extremes is advocated (Canadian Institute of Chartered Accountants [CICA], 1991, p. 67).

3.1.3. Time-series behavior and forecasting related to interim accounting numbers

This subsection focuses on two forecasting-related issues: (1) time-series analysis of quarterly earnings and (2) financial analysts' use of quarterly earnings in the

preparation of their forecasts. Studies dealing with both of these are reported here in order of publication.

3.1.3.1. Time-series behavior of interim financial statements

Foster (1977), using data for 69 firms covering the period 1946-74, reports that quarterly time series have two components: (1) an adjacent quarter-to-quarter component and (2) a seasonal component. His study reveals that markets adjust for the seasonality of reported quarterly earnings. Griffin (1977) reports the same two components of the quarterly earnings process. His research is conducted with data for 94 firms over the period 1958-71. The results of these two studies have important implications for forecasting purposes and also help the task of regulatory bodies.

Ball and Foster (1982) and Kinnunen (1988, appendix 2-1) provide a detailed list of other studies which assess the time-series behavior of interim accounting numbers.

3.1.3.2. Use of interim financial statements

Time-series research is later extended by taking structural changes, such as macroeconomic random shocks, into account. Lee and Chen (1990) report that more accurate quarterly earnings forecasts are obtained if such structural changes are taken into consideration.

Abdel-khalik and Espejo (1978) examine whether or not the announcement of interim earnings has any influence on the accuracy of annual earnings forecasts made by analysts. The study includes 100 firms in the Value Line Investment Survey for 1976. Their results show that use of the data reported in each of the first three quarters

increases the accuracy of annual earnings forecasts. Because the accuracy of annual earnings forecasts is highly correlated with the announcement of interim earnings, they conclude that analysts use interim reports in their forecasting work.

Hopwood, McKeown, and Newbold (1982) attempt to assess the amount of additional information contained in quarterly earnings compared with annual earnings. Their approach is to consider both quarterly and annual earnings in the prediction of the next annual earnings. Their data comprise 267 firms beginning in the first quarter of 1962 and containing 48, 52, 56, 60, and 64 quarters of information. They report increased forecasting accuracy when quarterly earnings are introduced into the model.

Collins, Hopwood, and McKeown (1984) examine the predictability of earnings for the first, second, third, and fourth quarterly reporting periods. Forecasts by securities analysts and time-series models are analyzed. The sample consists of 161 firms for the period 1951-79. Their findings indicate a strong pattern of larger forecast errors relating to the fourth interim period, regardless of the forecasting horizon. The pattern holds for both financial analysts' forecasts and for time-series models. These results are consistent with the view that fourth-quarter earnings include adjustments due to deviations in earnings estimates made in the previous three quarters.

Bathke, Lorek, and Willinger (1989) examine whether firm size is related to the predictive ability of quarterly earnings. Their primary sample has 109 firms covering the period 1967-82. They conclude that firm size does not affect the appropriateness of the common time-series model structure. Their results also indicate that the firm's

size affects the model's predictive ability. Greater predictive power is documented for larger firms vis-à-vis smaller ones.

Stickel (1989) studies the result of the process used by securities analysts to anticipate and respond to interim earnings announcements. The sample includes 7,526 interim announcements made by 1,251 firms for the period 1982-85. It is reported that revision activity after an interim announcement is greater: (1) if unexpected interim earnings are larger, (2) if there are competing analysts' forecasts, and (3) if unexpected interim earnings are negative. In addition, it is found that analysts are more likely to revise forecasts after third-quarter announcements than they are after first-quarter announcements. Analysts seem to be less likely to revise their forecasts early in the fiscal year than they are to revise their forecasts later in the fiscal year. One potential reason for this bias is said to be due to possible offsetting factors in later quarters.

Jones and Bublitz (1991) support the view that fourth-quarter earnings are noisier compared to earnings for other quarters. Their data consist of quarterly disclosures in 331 annual reports for 1983 and 308 annual reports for 1984. They find that every year the total number of extraordinary items in the fourth quarter exceeds the total number of extraordinary items in the other three quarters. Furthermore, the fourth quarter market reaction is less related to negative earnings surprises than it is to the reaction to quarters 1 through 3. This is in line with the view that earnings forecasting errors for the fourth quarter are highest.

Kang, O'Brien, and Sivaramakrishnan (1994) examine the properties of forecasting errors associated with forecasts made at the same point in time but for different future periods. Their final sample contains 132 firms with 743 forecasts for a five-quarter forecast horizon and 1,692 forecasts for a one-quarter forecast horizon. By basing forecasts on the same point in time they are able to freeze the underlying information set. They show that ex post biases are systematically different across differing forecast horizons, even when the forecasts are based on the same information set.

Laitinen (1994) studies interim reports to determine whether or not they contain quantitative or qualitative information that is useful in predicting annual financial ratios. The sample contains 25 commercial and industrial firms listed on the HSE during 1990-91. The interim reports used are the latest ones issued in each of these two years. The results indicate that the quantitative interim data contain useful information for predicting the next-year value of both the growth rate in net sales and the rate of return on investment. In addition, qualitative interim variables are important copredictors of: (1) the growth rate, (2) the rate of return on investment, (3) the shareholders' capital to total assets ratio, and (4) the current ratio.

3.1.4. Interim earnings and stock markets

The impact of interim earnings on stock markets has been studied fairly extensively. Early evidence suggests that quarterly earnings contain information that stock markets can use (Brown & Kennelly, 1972; Jones & Litzenberger, 1970; Kiger, 1972; May, 1971).

There are, however, some imperfections. Jones and Litzenberger (1970), for example, identify imperfections in market adjustment to information. Based on available quarterly earnings reports, they develop a stock selection technique that outperforms the market ten times out of ten. In addition, they raise very interesting questions related to the potential influence of the favorableness of an earnings report and its potential effect on different types of investor.

In the early 1970s, important implications were drawn that are still valid today. These may be summarized as follows (May, 1971, p. 151):

1. Any significant improvement in the quality of quarterly data themselves might lead to significant social benefits, since it appears that quarterly accounting data do influence the basis of actual investment decisions.
2. Any effort on the part of accountants that succeeds in unambiguously conveying to investors the lesser reliability of quarterly data will contribute to the prevention of potentially significant market inefficiencies, i.e., under- or overvaluation of securities in the period between market adjustments to quarterly earnings numbers and subsequent adjustments to the superseding, more reliable, annual earnings numbers.

3.1.4.1. Aggregate components

Brown and Kennelly (1972), using data for 94 firms covering the period 1951-67, draw two major conclusions. First, quarterly earnings per share (EPS) reports are useful in predicting aggregate abnormal returns. Second, the disaggregation of annual EPS into its quarterly components improved the predictive ability of the EPS series by 30 to 40 percent over that possible when the components are aggregated. This shows

that quarterly data contain detailed earnings information not revealed by annual figures.

Hopwood and McKeown (1985) attempt to establish whether the interim earnings information content is due to interim sales and/or interim expenses. The foundation of the study is discussions challenging the relevance of interim reporting. The sample consists of 238 Compustat firms with accounting data for 68 consecutive quarters, beginning in the first quarter of 1962. They conclude that both interim sales and interim expenses contribute to the information content of interim earnings.

3.1.4.2. Reporting lags

The reporting lag is defined as the number of days from the date of the end of the quarter/fiscal year to the publication date. The reporting lag is important when considering the informational value of a single report to the market. Zeghal (1984), in the context of both quarterly and annual reporting, studies the impact of the length of the reporting lag. His sample comprises 4,186 annual and 11,933 interim reports between 1973 and 1975 (NYSE and AMEX firms). He finds the reporting lag to be shorter for interim reports than it is for annual reports. The mean lag for interim reports is 27.2 days and for annual reports 46.6 days. He measures information content by return magnitude and volume. The results show that the information content especially of interim, but also of annual, accounting reports with a short delay exceeds the information content of reports with a long reporting lag. Furthermore, the author discussed the somewhat different roles that the two classes of report may represent. Interim reports may have an anticipatory role in annual earnings forecasting, while audited annual reports play a confirmatory role.

Freeman and Tse (1992b) examine intercompany information transfers using quarterly earnings data. They find that security prices for late announcing firms have already reacted to the information provided by early announcers in that industry. Logically, they also report that the greatest reaction is associated with the first industry announcement. They are able to extend prior research, such as Foster (1981), by showing that the price reaction of the late announcer to early announcements is strongest in industries with the highest earnings comovement.

3.1.4.3. Delayed adjustment to new information

Joy, Litzenberger, and McEnally (1977) study stock price adjustments to quarterly unexpected earnings. Their sample consists of 102 firms continuously listed from 1963 through 1968. Weekly stock price data suggest that the stock markets are somewhat inefficient in the adjustment process. Similar results are reported by other researchers at about the same time. Watts (1978) finds that systematic abnormal returns exist after quarterly earnings announcements in the period 1962-65. However, the benefit to the potential investor of this inefficiency is not substantial as it is unlikely to exceed the direct transaction costs. Morse (1981) reports delayed market reaction to quarterly earnings announcements.

More recently, too, researchers have reported that markets systematically fail to apply all the information contained in earnings. An important and thorough publication in this area is that by Bernard and Thomas (1990). They report that stock prices do not fully reflect quarterly earnings information. Specifically, applying a three-day window, they find that the current quarter's earnings can be used to predict the price reactions to the following four quarters' earnings announcements. Further insight into

this finding is provided in Ball and Bartov (1996). A detailed discussion related to stock market anomalies is reported and discussed by Ball (1978, 1992).

3.1.4.4. Business risk

McNichols and Manegold (1983) investigate the impact of the introduction of interim reports on the information content of annual earnings. The information content is measured by the variance of returns. Specifically, they suppose the marginal information content of an annual earnings report to be greater when it has not been preceded by quarterly reports. Also, the relationship between the information environment of a firm and its systematic risk is studied. The data are from 34 AMEX firms. Some have annual reporting only. Others have both interim and annual reporting. The results indicate that the marginal information content of annual earnings is reduced significantly when interim earnings announcements are available. The authors are not able to find any significant relationship between interim reporting and risk.

Rippington (1991) studies four firm-specific events and their information content: (1) the preliminary announcement of annual accounting numbers, (2) the annual report and accounts, (3) the annual general meeting, and (4) interim reports. The sample consists of 337 firms listed on the London Stock Exchange as of June 30, 1981. The preliminary announcement and interim report have the highest information content. An abnormally strong reaction is found for interim reports containing bad news. A similar tendency is found in Schadewitz (1992). The results support the view that annual reports and accounts, on aggregate, lack the investment utility provided by more timely information.

3.1.4.5. Market risk

It is possible that the disclosure of even a single item in an interim report may have an influence on the information content of the report. Lee (1987), studying the period 1975-86, investigates whether or not interim segment reporting has an influence on the market. He suggests that interim segment information produces reduced variability of returns and a decreased value of betas around the time of earnings announcements. The data are a random sample of firms that introduce a change in interim reporting disclosure practice over the period. His final sample contains 28 firms. The results are somewhat inconclusive. However, the study reveals that disclosing segment information in interim reports is associated with reduced variability of returns. This is evidenced for second-quarter segment disclosures. No reasons are offered why second-quarter segments are especially significant. Moreover, no effort is made to explain the lack of significance with respect to the firm's beta.

3.1.4.6. Stock valuation

Hopwood and McKeown (1990) study the association between both statistical earnings forecasts and financial analysts' forecasts and security returns. They report that statistical model forecasts and financial analysts' forecasts are associated with security returns. The apparent superiority of analysts' forecasts over statistical models disappears after controlling for the analysts' timing advantage. Timing advantage, in this context, refers to the analysts' ability to make forecasts closer to the announcement date than statistical models can.

3.1.4.7. Growth potential

Aharony and Swary (1980) study the impact that quarterly dividend and earnings announcements have on stock returns. Their sample contains 149 NYSE-listed industrial firms over the period 1963-76. In order to isolate dividend and earnings effects, the sample contains only those quarterly dividend and earnings announcements with separate publication dates. They conclude that both quarterly dividend announcements and quarterly earnings announcements are signals of the prospects of the firm.

Dempsey (1994) studies whether potential interim earnings manipulation is reflected in fourth-quarter earnings announcements. The intuition behind the study is related to income-smoothing. It is supposed that nonaudited quarterly reports offer managers the possibility to engage in income-increasing and/or expense-reducing accounting procedures (see also Alford & Edmonds, 1981; Givoly, Ronen, & Schiff, 1978). Therefore it is possible that investors know this and logically react more to bad interim news than to good interim news. The results, however, show evidence of a larger reaction to fourth-quarter good news earnings than to fourth-quarter bad news earnings. No reason is offered for this anomaly.

3.1.4.8. Firm size

Bamber (1987) studies factors that are systematically associated with investors' use of accounting disclosures. First, she investigates whether or not larger unexpected earnings are related to higher unexpected share trading volumes around quarterly announcements. Second, she seeks to determine whether or not larger unexpected

earnings are associated with longer periods of abnormally high trading. The data comprise about 900 first, second, and third-quarter earnings announcements made by 195 firms between 1977 and 1981. The results indicate that the magnitude and duration of the trading volume reaction to quarterly earnings announcements are increasing functions of unexpected earnings and decreasing functions of firm size. In partial confirmation, Davis (1989) reports that size is related to the market reaction. Earnings releases by small firms cause greater market reactions than earnings releases by large firms.

Seasonal patterns in security returns around quarterly earnings announcements are documented by Chari, Jagannathan, and Ofer (1988). They examine the average excess return around quarterly earnings announcement dates for 2,527 firms covering the period 1976-84 (62,515 quarterly earnings announcements). The results show that returns for small firms are substantially above average two days before the announcement. This pattern is not found for large firms. Also, the variance of daily stock returns prior to and at the event are higher for small firms than they are for large firms.

Kross and Schroeder (1988) study the effects of a firm's prominence on the information content of quarterly earnings announcements. Their data consist of 3,552 observations (twelve quarters, 296 firms in each) for the period 1978-80. Prominence is proxied by the number of column inches reported in the *Wall Street Journal Index*. Their major finding is that earnings announcements convey more information about obscure firms than they do about prominent firms.

Studies of earnings response coefficients (ERCs) have improved comprehension of the price-earnings relation. Both annual and interim earnings numbers are the subject of ERC studies. Easton and Zmijewski (1989) find that ERCs vary between firms. Their sample size ranges from 104 to 206 firms, with each firm having 20 quarterly time-series observations. For a firm to be included in the sample, Value Line forecasts had to be available for the six-year period 1975-80. The results indicate: (1) a positive association between the ERC and the coefficient relating current earnings to future earnings, (2) a negative association between the ERC and systematic risk, and (3) a positive association between ERC and firm size. Although ERC studies increase understanding of the relation between prices and earnings, the ERC values obtained are still below the theoretical values (Bernard, 1989, pp. 89-90; Lev, 1989). One way to gain improved understanding of low ERCs is to try to capture the potential asymmetry in information reflected in prices and earnings. Kothari and Sloan (1992) take this potential timing difference into account. They show that annualized ERCs systematically increase when the earnings and return measurement interval is extended. The average annualized ERC, using quarterly data, is 1.58. It increases to 4.91 when four-year data are used. A similar tendency in results has been observed using nonlinear models (Freeman & Tse, 1992a).

Kross and Schroeder (1990) investigate seasonality in stock price responses to quarterly earnings. In particular, their investigation concerns the precision of small firms' quarterly reports. Based on earnings announcements between 1978 and 1980 (3,552 observations) they report that the return response to unexpected earnings for small firms in the fourth quarter is lower than it is for other interim quarters. They assume the reason for this is that with small firms interim estimation errors are

clustered in the fourth quarter. In larger firms, such biases are corrected during prior quarters.

Shores (1990) studies the association between interim information and security returns around earnings announcements. The study develops seven firm-specific attributes as a proxy of the level of interim information (op. cit., p. 167): (1) firm size, (2) number of financial analysts, (3) number of interim earnings announcements, (4) number of nonearnings announcements, (5) trading volume, (6) number of market makers, and (7) bid-ask spread. The sample comprises 2,156 annual earnings announcements made by OTC firms between 1983 and 1984. Interim earnings announcements are obtained from the *Wall Street Journal Index*. The results support the theory that interim information preempts the information content of annual earnings.

3.1.4.9. Legislation and regulation

In order to explain reporting practices it is important to take into account the development of the regulatory framework. It should be noted that one important aspect of positive accounting theory is to study the evolution of accounting standards (Watts & Zimmerman, 1978, 1990). Watts (1977) and Ball (1980) identify the regulatory environment as an important element in the determination of the magnitude and character of disclosure. Ball makes the following comment about the impact of the regulatory environment (1980, p. 37):

One type of specification error seems common to the entire class of policy effect experiments, almost without exception. The error is to assume that accounting policy changes are exogenous, as if they were acts of nature or as if they were induced by the experimenter in a controlled laboratory

environment. However, there are potentially severe identification problems associated with this type of assumption. Environmental changes are likely to create a type of demand for changes in the accounting policy set; and policy changes can be thought of as a type of supply process. The experimenter observes the joint effect of both. It then follows that there can be complicated problems of timing and control in this type of experiment.

Cornell and Landsman (1989) examine the impact of three elements on stock prices. These are: (1) forecast revisions made one quarter ahead, (2) forecast revisions made one year ahead, and (3) forecast errors. The final sample comprises 2,777 announcements made by 330 firms from the third quarter of 1984 through the third quarter of 1986. They find that analysts' forecast revisions provide significant incremental explanatory power in a pooled regression of abnormal returns on forecast errors and analyst forecast revisions. The results are not identical across quarters. Fourth-quarter announcements are found to provide more information to analysts and investors than other interim announcements. The authors interpret the finding to mean that analysts use interim announcements to forecast earnings one quarter ahead. In addition, fourth-quarter announcements are uniquely informative in annual forecast updating. The possible reasons given for these two results are that only year-end statements are audited and that fourth-quarter results may contain some corrections of earnings reported in prior quarters.

Recently Frost and Kinney (1996) documented evidence on the nature and timing of disclosures by foreign registrants to the SEC (see also section 4.2.1 below). Their research design is relevant because the SEC has relaxed some disclosure requirements for foreign registrants. The authors report, among other things, that (1) foreign firms file fewer interim reports than U.S. firms, (2) their reports are filed later, (3) they

announce earnings later, and (4) over 80% of them use non-U.S. Generally Accepted Accounting Principles (GAAP). Furthermore, the differences in disclosure are related to firms' filing status. Finally, the lack of scrutiny directed by U.S. analysts at foreign registrants is consistent with the rather low disclosure levels of these firms.

3.1.4.10. Period disclosed

Hagerman, Zmijewski, and Shah (1984) provide further evidence that quarterly earnings contain information useful to the stock markets. Their data are derived from 215 NYSE or ASE firms over the period 1974-76. There are 2,189 quarterly announcements and 404 annual announcements. The results support the notion that stock prices are influenced by quarterly earnings information. In addition, the fourth-quarter information signal is more highly associated with prices than is the case with annual earnings.

Due to the proximity of first and fourth-quarter interim reports to the publication of annual earnings, a strong relation between first and fourth-quarter interim earnings and annual earnings is presumed to exist. To avoid this correlation, Atiase (1985) focuses on second-quarter earnings announcements. Specifically, he attempts to determine whether or not second-quarter information influences price behavior around the time of earnings announcements. His data comprise 200 sample firms with second-quarter earnings reports between 1971 and 1972. The findings are consistent with previous research, indicating that price revaluation occurs during the event week. In addition, he discovers that the price revaluation is inversely related to the differential levels of (private) predisclosure information production and dissemination.

Mendenhall and Nichols (1988) report differences in market reactions to reported earnings in earlier quarters versus reported earnings in the fourth quarter. Their study is based on the possibility that managers exercise discretion over expense reporting in the first three quarters but are unable to do so for the entire reporting year. The authors assume that managers will delay bad news announcements as long as possible. Their results support this view. However, a published discussion of this paper points out that fourth-quarter earnings might be noisier than previous quarters' earnings. This alone might cause different market reactions (Palepu, 1988).

Although the majority of studies focusing on interim reports are based on quarterly data, there is also evidence that the behavior of the return-earnings relation is valid for interim reporting periods other than quarterly. This is evidenced in Finland (Schadewitz, 1992) and the U.K. (Opong, 1995).

Information content research is closely related to market microstructure. Because the present study is not directly a market microstructure study, that literature is not discussed here. However, the interested reader could begin with a review of Brown, Clinch, and Foster (1992).

3.1.5. Summary of interim reporting research

The studies cited above indicate that the amount of research focusing on interim reports is fairly substantial. In addition, they show the variety of purposes for which interim reports are used. In this subsection, a few major conclusions are offered, based on the literature survey. In general, it can be said that interim reports reduce the

uncertainty related to a firm's operations observed and monitored by outside interest groups.

First, as with annual earnings numbers, aggregate interim earnings seem to contain useful information for the market around the time of the announcement. Second, separate interim income statement components contain incremental information. The usefulness of interim reports is also supported by the fact that some firms voluntarily publish interim reports. Third, quarterly earnings time-series have both an adjacent quarter-to-quarter component and a seasonal component. Fourth, interim earnings are useful in annual earnings predictions. Fifth, some anomalous price behavior is reported. The market seems not to use all the information that reported earnings actually contain. The above findings are mainly based on studies conducted with readily available databases such as Compustat and CRSP (Center for Research in Security Prices).

Current knowledge related to other information that is published in conjunction with interim earnings is much more limited. The importance of identifying the net benefit of publishing voluminous nonearnings data has been recognized (Lev & Ohlson, 1982, p. 250):

Accounting data convey useful and timely information to investors. While this conclusion definitely holds for earnings data, the marginal contribution of the voluminous nonearnings data published in financial reports is still largely unknown. Given the nontrivial costs of information disclosure and dissemination, this issue obviously deserves more research attention.

Some recent studies provide new insight into disclosures other than earnings (Lev & Thiagarajan, 1993; Martikainen, 1990; Ou & Penman, 1989). However, each of these studies is based on annual financial statement analysis. These studies are characteristically based solely on financial statement numbers/ratios, without taking into account managers' nonquantified analyses disclosed in annual reports along with the accounting numbers. Hoskin, Hughes, and Ricks (1986) address this deficiency. They find that qualitative comments by officers made concurrently with earnings appear to be important disclosures (op. cit., p. 28):

Perhaps the most notable and least anticipated finding is the significance of officer comments regarding the future prospects of their firms. The implication is that such comments are informative as well as credible. One possible explanation is that reputation serves to discipline officers in ways that we do not yet fully understand. Given the availability of officer comments on the Dow Jones News Retrieval Service at times other than the time earnings are announced, an extension of this study would be to investigate associations with stock returns for those comments as well.

The paper's findings are confirmed by Brown (1986, p. 36):

The finding that prospective operating data and prospective officer comments are informative for valuing firms' common shares is the primary contribution of the study. Further research should examine how capital markets price these subjective data and should examine officer comments made at times other than earnings announcement dates.

Smith (1991) also reports that the quantitative (change in earnings per share) and qualitative commentary (management's narrative) in annual reports are both important in explaining market reactions to annual earnings announcements. Bryan (1994), too,

finds that the management discussion and analysis contains incrementally relevant information.

The somewhat limited ability of theory to guide researchers to a fuller understanding of the use of accounting information calls for more detailed analysis with small samples. Bernard (1989, p. 106) concludes his review of capital market research in accounting by saying:

The key to further progress in this arena is to avoid being overly ambitious. There is much groundwork to be laid. The suggestions of section 5 [The role of accounting in equity valuation] - moving to more within-industry analyses, explicitly considering how the information conveyed by accounting numbers is conditioned on the economic context, gaining a better understanding of the relations among accounting numbers before introducing price data, emphasizing economic interpretation more and statistics less - may be useful in laying that groundwork.

Academic literature reviewing evidence associated with business communication seems to be based on single-firm analyses (Healy & Palepu, 1993, 1995). There is an evolving literature on the role and properties of disclosure.

Although not all of the above is directly related to interim reporting, it illustrates the areas in which new insight can be gained. Interim reports are one potentially fruitful medium of communication by a firm to its interest groups. It is likely that interim reports reflect managers' communication propensities, especially at in the early stages of the development of interim reporting. Study of those reports will, therefore, have the potential to deepen understanding of the role of accounting in the capital markets.

Besides the above reasons for studying interim reports in general, there is a particular need for this type of focus in Finland, where information content studies have concentrated on annual financial statement information. Yet the potential benefits that investors might derive from investigation of Finnish interim reports and the lack of research determining whether or not this is actually the case are recognized (Martikainen, Yli-Olli, & Gunasekaran, 1991, p. 278):

An extremely important change in the Finnish stock market has been the improved quality and quantity of interim reports. Each listed firm must publish at least one interim report each year. So far, however, no studies exist concerning the informational value of these reports to Finnish investors.

This study is designed to help eliminate these deficiencies by adding to the very small body of literature addressing the information content of Finnish interim reports (Bergström, 1989; Laitinen, 1994; Schadewitz, 1992). One crucial element of the present research is to measure the nonearnings information disclosed in interim reports. This will be done by the use of disclosure indices. The next section introduces and summarizes disclosure index research covering a time span of over 30 years.

3.2. Investigation of the determinants of the information disclosed in interim reports

This part of the survey of prior research focuses mainly on the development of disclosure index literature. Some problem areas related to this literature are identified. This is done in order to illustrate the necessity of the improvements incorporated in the disclosure index constructed in this study.

Beginning with the early work by Cerf (1961), the use of financial reports has been a continuous topic of study. In the 1970s, disclosure research was fairly intense, mainly in the U.S.A. One of the obvious reasons is that the U.S. Securities and Exchange Commission (SEC) issued “more accounting releases since 1972 than it had in the previous 26 years.” (Beaver, 1978, p. 44). Prior to 1976, the level of disclosure was interpreted by applying variables mainly based on a prima facie understanding of the use of disclosure. Appendix A summarizes some of the studies. Marston and Shrivess (1991) provide a review of these studies.

Theoretical developments during the 1970s helped to formulate more specific and advanced research hypotheses for corporate disclosure. One of the key works in the development of the theory was Jensen and Meckling (1976). Following their study, disclosure mainly attempted to explain the monitoring function of principals in the relationship between principal and agent (outsiders and management). However, some of the variables based on the monitoring function were insufficiently derived. This deficiency has led to criticism. Leftwich, Watts, and Zimmerman (1981) attempted to explain voluntary interim reporting in terms of the theory of agency and monitoring. Burton (1981) and Schipper (1981) argue that the theory of agency and monitoring is not sufficiently developed to accommodate the level of institutional detail in the variables proposed by Leftwich et al. Ball and Foster (1982, p. 192) agree. It has also been suggested that the Leftwich et al. study should be replicated, since the data are over 30 years old. The recommendation is to do so in European countries with more recent data (Burton, 1981, p. 83).

Several conclusions can be drawn based on prior literature. The emphasis in disclosure index studies to date has been on annual reports. The reason for using annual reports instead of interim reports is not usually explicitly stated. It appears that large firms disclose more information than small ones. The concern of the capital markets is with high disclosure. Over time, the quality of disclosure seems to have improved. Risk measures, such as beta, seem not to be undisputedly related to disclosure. It is also interesting to note that accountants and analysts have somewhat different views of the importance of various items. This indicates the lack of communication between different interest groups. It should be borne in mind that the vast majority of the studies listed in appendix A have somewhat different indices. One of the studies, Wallace (1988), standardizes indices in prior studies in order to establish whether there is a consensus in different disclosure studies.

Wallace (1988) standardizes the disclosure indices used in nine studies. The author reports 16 disclosure indices. Standardization allows the importance of items in each separate study to be evaluated together. One outcome of this standardization is that the items applied in previous studies are all categorized into dominance quartiles. The dominance of a quartile reveals the preference of different user groups for that item. It is reported that there are 15 items in the most important dominance quartile, which has a perception consistency of over 60 percent. There seem to be only a limited number of items with the highest importance.

Therefore, the best policy to follow in the construction of a disclosure index would seem to be to make the number of items as small as possible without sacrificing important items. The American Institute of Certified Public Accountants has

mentioned this in one of its recommendations (Recommendation No. 7 in AICPA, 1994, p. 124): “Standard setters should search for and eliminate less relevant disclosures.”

During the 1990s, more user-defined disclosure indices have been applied. These studies attempt to determine what disclosures are effective in business communication. Recently, the focus has moved toward an integral type of disclosure strategy (Lev, 1992). Ratings published by the Association for Investment Management and Research (AIMR) have been applied in several recent studies (see appendix A). Although these indices are probably more user-oriented than those developed in prior studies, there are also some deficiencies. One is that the AIMR indices are not necessarily based directly on original reports. Lang and Lundholm recognize this deficiency (1993, p. 269):

As mentioned previously, however, use of these disclosure scores [published by the Financial Analysts Federation (FAF), AIMR comprises the Institute of Chartered Financial Analysts (ICFA) and FAF] is not without its dangers; particularly because the data are based on analysts’ ratings rather than the disclosures themselves. To the extent that analysts’ ratings are biased and the bias varies cross-sectionally with the independent variables of interest, care should be exercised in interpreting the results.

In addition, those opinions that constitute the ranking of intertemporal studies probably change over time. This would also cause some biases/inconsistencies over time. In this study, the measures of disclosure are established from the original interim reports to minimize the influence of any perceptive bias.

4. Institutional regime influencing interim reporting

Financial accounting research is commonly carried out in a setting with a given institutional structure. Thus there is a need to describe the relevant parts of the institutional structure that relate to this particular study. The importance of the institutional regime is pointed out in Ball and Foster (1982, p. 165):

In particular, the researcher must attempt to match the constructs of the discipline with institutionalized data and must be prepared to live with the anomalies arising from the imperfect match. Viewed against research in the basic disciplines, accounting research tends to emphasize the mapping of theory into institutional data.

The above citation indicates the importance of recognizing the institutional setting. Providing a description of the relevant characteristics of a particular institutional regime has at least two major advantages. First, it puts the reader in a better position to evaluate the research design and the findings. Second, the reader is provided with a basis for evaluation of the impact of different institutional settings, as also pointed out in Alford, Jones, Leftwich, and Zmijewski (1993, p. 213). Interim reporting is one of many means of communication open to a firm. Interim reporting is a very common phenomenon and is used in many countries. Because of this, it is possible to increase understanding of interim reports by studying the sensitivity of the results so far obtained to different regulations in different countries at different times. The outcome of this investigation should be advances in the development of theory, especially in terms of: (1) better separation of institutional domains and (2) theoretically mature explanations of the differences. Through this, there should be a growing awareness of how to better assist the regulators, producers, and users of financial accounting data.

Section 4.1 briefly introduces some international differences in the accounting associated with interim reporting. Due to the multitude of differences in technical aspects, the review is restricted to an overview. A greater detailed presentation, focusing on European accounting, can be found in Blake and Amat (1993). This review is designed to give a sense of the range of differences in accounting regulations between countries.

Section 4.2 is devoted to a review of interim reporting regulation and legislation in three countries. The countries selected are Finland, the U.S.A., and Sweden. The U.S. is selected as the benchmark, due to the existence of a large amount of relevant literature based on U.S. data. Finland is included because the data of this study are Finnish.

There are several reasons besides geographical proximity for selecting Sweden as the comparable Nordic country. One reason is the close economic relations between Finland and Sweden. Based on total imports and exports in 1994, Sweden was Finland's second largest trading partner (Statistics Finland, 1995b, p. 220). Second, there is a research tradition in finance and financial accounting whereby Finnish and Swedish data are compared (Martikainen, Yli-Olli, & Gunasekaran, 1991, pp. 274-275). Third, at a more practical level, foreign analysts usually monitor the Nordic countries as a single entity (Jääskeläinen & Roine, 1992, p. 52). Therefore it is important that the information on which their analyses are based is as comparable as possible. Furthermore, historically there is a tradition of collaboration, especially between Finland and Sweden, but also between the Nordic countries in general, in the

area of regulation and legislation. More background information on the regulation of financial reporting in the Nordic countries can be found in Flower (1994).

4.1. International overview of interim reporting practices

Gray, Campbell, and Shaw (1984) survey the interim reporting practices of 30 countries. The study includes Finland and the U.S.A., but not Sweden. The survey is based on relevant current statutes as of 1 January 1982. Interim reports are required or recommended in 21 of the 30 countries. Semiannual reports are required in ten countries. Quarterly reports are required in nine countries. This latter group includes the U.S.

An analysis of 200 annual reports of the world's largest companies can be found in Tonkin (1989). It includes 25 U.S. firms, six firms from Sweden, and a firm from Finland. Bavishi (1989) contains information about 24 countries. One part of that study contains general trends in the form and content of interim reporting. Bavishi (1989) reports that in Canada, West Germany, and the U.S., interim reports are almost exclusively on a quarterly basis and in Finland, Norway, and Sweden a four-month reporting period is common. Recent work by Hussey and Woolfe (1994) reports that the majority (66%) of countries (total number of countries in their sample is 35, including Finland, Sweden, and the U.S.) have a reporting requirement of half-yearly or more frequent (op. cit., p. 49).

Alford et al. (1993) study the reporting practices of 18 countries (including the U.S. and Sweden, but not Finland). The authors report that annual accounting earnings in Denmark, Germany, Italy, Singapore, and Sweden reflect less-timely or less value-

relevant information than in U.S. accounting earnings. Alford et al. (1993) point out that it is important to relate these differences in accounting data to variations in financial reporting requirements and disclosure practices. Choi (1991) reports that the Toronto, Frankfurt, Tokyo, London, and New York stock exchanges all require interim reports. However, only the Toronto and New York stock exchanges require quarterly reports. The other three require semiannual reporting.

There are differences in accounting regulations between countries. In addition, there seems to be pressure for international accounting harmonization and disclosure. Radebaugh and Gray (1993, pp. 141-180) provide an extended discussion of the role of governments, trade unions and employees, investors, bankers and lenders, the general public, and accountants and auditors in the harmonization of disclosure practices.

According to Gray, Campbell, and Shaw (1984), interim reports more often contain income statements than balance sheets (op. cit., p. 516). At the time of their study, audited interim statements were required in only five of the 30 countries surveyed: Argentina, Australia, Brazil, Japan, and Thailand. An interim fund flow statement was required in three countries: Brazil, Chile, and Mexico. It appears that there are almost no requirements at all regarding the forecasting of information in interim reports. No reason for this phenomenon is discussed. One potential explanation that the author offers is the seasonality associated with inflows and outflows and the difficulty of adequate forecasting resulting from this kind of uncertainty.

One of the central aims of interim reporting is to provide the user with timely information. The timing of the publication of information is, therefore, an important factor associated with interim reporting. About half of the countries in the Gray, Campbell, and Shaw (1984) study have requirements stating limits within which an interim report must be published. The variations in the allowable lags are, however, very large: from one to five months. The reporting lags of Finnish interim reports may be seen in appendix E.

The general differences between countries vis-à-vis interim reporting requirements set the stage for the next section, 4.2. This section focuses solely on the interim reporting practices in the U.S.A., Sweden, and Finland.

4.2. A chronology of the recent regulation of interim reporting in the U.S.A., Sweden, and Finland

This section briefly reviews the regulatory development of interim reporting in each of the three countries. The emphasis is on a general review of the development over time, rather than the description of many technical aspects. The purpose is to give the reader a view of interim reporting differences and similarities in the three countries. Country-specific presentations are followed by a comparison section. Each country's regulation history is briefly presented in chronological order.

4.2.1. Developments in the U.S.A.

Of the three countries presented here, the longest tradition of interim reporting is in the U.S.A. The development of interim reporting occurred in several phases. A detailed and very enlightened description of the development of U.S. interim reporting

can be found in Leftwich, Watts, and Zimmerman (1981). A comparison of interim reporting between the U.S.A., Canada, and New Zealand can be found in a research report by the Canadian Institute of Chartered Accountants (1991, pp. 147-158). A comparison of interim reporting between the U.S.A. and the U.K. is given in Hussey and Woolfe (1994). A broader comparison of accounting disclosure practices with some empirical evidence comparing the U.S. and the U.K. can be found in Frost and Pownall (1994).

The Accounting Principles Board (APB) Opinion No. 28 on "Interim Financial Reporting" forms the basis of current interim reporting practice in the U.S. Its publication date is May 1973. Its effective date is for interim periods related to fiscal years beginning after December 31, 1973 (Financial Accounting Standards Board, 1994, p. 303). In other words, APB Opinion No. 28 has been in force over 20 years. Articles written at the time of the publication of Opinion No. 28, such as Bows and Wyatt (1973) and Miller (1973), indicate the prevailing need for the Opinion. Miller (1973, p. 755) states the following:

The Opinion is responsive to the recent emphasis on the need for more accurate and informative interim financial reports. This emphasis may be attributable (1) to reactions of financial analysts and others who questioned the credibility of published interim financial information which all too often has been subject to year-end "adjustments," and (2) to CPAs who have sought guidance because of their increased involvement with interim statements and to the interim reporting requirements which the Securities and Exchange Commission (SEC) promulgated recently.

The minimum disclosure of interim financial information for public firms is as follows (Mottola, 1991, p. 9:12):

1. Sales or gross revenue, provision for income taxes, extraordinary items (including related income tax effects), cumulative effect of a change in accounting principles or practices, and net income.
2. Primary and fully diluted earnings per share for each period presented, determined in accordance with the provisions of APB Opinion No. 15 "Earnings per Share."
3. Seasonal revenue, costs, or expenses.
4. Significant changes in estimates or provisions for income taxes.
5. Disposal of a segment of a business and extraordinary, unusual, or infrequently occurring items (with explanation).
6. Contingent items.
7. Changes in accounting principles or estimates.
8. Significant changes in financial position (i.e. liquid assets, net working capital, long-term liabilities, or stockholders' equity).

The above data should be presented for the current quarter and current year to date or for the last 12 months to date, together with comparable data for the preceding year. In addition, if there is no separate fourth quarter report, the APB requires a note in the annual financial statements containing the data specified above or at a minimum: (1) disposal of segments of a business; (2) extraordinary, unusual, or infrequently occurring items; and (3) the aggregate effect of year-end adjustments that are material to the results of the quarter (op. cit., p. 9:12).

Besides APB Opinion No. 28, there are two other sources of interim reporting guidelines: (1) the disclosure requirements of stock exchanges and (2) the Securities and Exchange Commission (SEC) requirements for interim reporting. The

requirements of stock exchanges are considered to be generally less extensive than those set forth in APB Opinion No. 28. Therefore, this study does not include specific coverage of the requirements of stock exchanges. It is mentioned here only that the NYSE and AMEX require quarterly reviews, with some exceptions in cases where it would be impractical or there might be a danger of misleading the public. As regards reporting lags, the NYSE requires information to be reported as soon as it is available (op. cit., p. 9:13). The AMEX requires information within 45 days.

The requirements of the SEC for interim reports represent the third major influence over the formation of interim reports in the U.S. The SEC requires public firms to file their quarterly information on Form 10-Q. This information includes:

1. A condensed balance sheet at the end of the quarter.
2. Condensed statements of income, retained earnings, and cash flows for the quarter and the year to date.
3. An exhibit setting forth the earnings per share computation in reasonable detail.
4. Notes describing in detail any material events (e.g. lawsuit settlements) or other changes deemed to be materially important to shareholders.

These quarterly reports need not be reviewed by external auditors. However, Ettredge, Simon, Smith, and Stone (1994) find that firms with high agency costs tend, voluntarily, to purchase a review by an external auditor.

The use of auditors is also related to the usefulness of the interim reports. McEwen and Schwartz (1992) find that firms do not always disclose all the information

required by APB Opinion No. 28. They suggest stricter enforcement: one way being a compulsory external audit. Deitrick and Alderman (1979) suggest the same thing.

The view taken by the SEC is that interim results are an integral part of the annual period. Therefore, in cases where unusual or significant events occur within a quarter, Form 8-K should be used as an addendum. Events that qualify for such treatment include elements like: (1) changes in control, (2) major acquisitions, and (3) changes in the firm's external auditor.

4.2.2. Developments in Sweden

In Sweden interim reports are regulated by the Companies Act of 1975, §§12-14 [Aktiebolagslagen 1975, §§12 -14]. Cooke (1989a, p. 126) summarizes the regulation and legislation of interim reports in Sweden as follows:

As well as a difference with respect to funds statements' all larger companies [according to shareholders equity, number of employees, net assets, branch of a foreign enterprise, or listed shares or bonds (Cooke, 1989a, p. 79)] are required to file, with the registratory authority, an interim report covering not less than half, but not more than two-thirds' of their financial year. Again there is no obligation for the company to distribute copies of the interim report to shareholders although copies must be made "available at the office of the company for anyone and it shall be sent at once to a shareholder who requests it." There is no requirement for an interim report to be audited. An interim report must contain a brief description of the company's activities, financial results, investments, and changes in working capital and financing during the period. In addition, the amount of turnover and the profit or loss, before changes in untaxed reserves and tax, must be disclosed. Information contained in the interim report must be provided for the period under review and for the same interim period during the preceding financial year.

The permissible reporting lag is two months. In addition, the interim report information should as far as possible be comparable with the concepts and terms in the previous annual report. Importantly, firms listed on the Stockholm Stock Exchange (SSE) A list must sign a registration agreement which obligates them to publish interim reports on at least a six-month basis.

As in the U.S.A., Swedish financial analysts have also provided some recommendations covering interim reports (Föreningen Auktoriserade Revisorer, 1995, pp. 971-973). It is interesting to note that the analysts explicitly state that a firm's presentation of information should not be affected by the quality of the information it contains (favorable or unfavorable) and prefer quarterly reporting to longer reporting intervals. Tertiary reporting is considered a second best. One interim report only per year is considered less adequate than more frequent interim reporting (op. cit., p. 971).

The analysts also propose a format for annual forecasts in interim reports. More specifically, annual forecasts may be fairly general in the first interim report and become progressively more precise in ensuing interim reports during the year (op. cit., p. 972). In addition, the analysts recommend that when there is a deviation of over 10 percent from the forecast, the firm should immediately announce that fact (op. cit., p. 972). From 1995, the registration agreement also extends to the recommendations made by the Swedish financial analysts.

4.2.3. Developments in Finland

The four major steps in the development of interim financial statement regulations are:

1. January 1, 1986 (effective date) recommendation concerning interim financial statements (HSE Cooperative, 1988, p. 18),
2. December 31, 1987 (effective date) recommendation for a listed firm's interim financial statements (HSE Cooperative, 1991, pp. 47-48),
3. January 1, 1990 (effective date) recommendation concerning interim reports (HSE Cooperative, 1991, pp. 26-27), and
4. January 1, 1994 (effective date of the amendments) the Securities Markets Act of 1989 [Arvopaperimarkkinalaki 1989] including regulations for interim reports (HSE Cooperative, 1995, p. 19).

The recommendation of December 31, 1987 consists of the minimum items that a listed firm has to announce. Below is the structure of the recommended income statement at that time (HSE Cooperative, 1991, p. 48):

$$\begin{array}{r} \text{result after financial items} \\ \text{+/- other income and expenses} \\ \hline = \text{result before closing entries and taxes.} \end{array}$$

The recommended information should (op. cit., p. 48): “be given for the period to be analyzed and comparative information for the corresponding time during the previous accounting period as well as for the whole previous accounting period.”

The recommendation of January 1, 1990 requires more detailed specification of, for example, changes in the listed company's commitments compared to the previous

recommendation. The statute of January 1, 1990 required firms to make public their decision concerning the number of interim reports to be published in the coming financial year. Under the January 1, 1986 recommendation, the latest permissible publication lag was three months (HSE Cooperative, 1988, p. 18). Under the January 1, 1990 recommendation, the interim report had to be made public one month earlier: “within two months after the close of the period reviewed.” (HSE Cooperative, 1991, p. 27). The Securities Markets Act allowed the lag to be one month longer: three months.

The latest recommendation of January 1, 1994 bears many resemblances to its predecessor, the January 1, 1990 recommendation. The major difference is that the current recommendation is part of the Securities Markets Act and as such its legal status is considerable (HSE Cooperative, 1995, p. 19). With respect to the interim report, the company must observe the regulations of §5 of Chapter 2 of the Securities Markets Act. Interim reports must also comply with the Resolution of the Ministry of Finance (op. cit., p. 40). The guidelines of the HSE are also valid in parallel. It should be mentioned that the current legislation and regulation of interim reports in Finland conform with EU practice.

According to the Resolution of the Ministry of Finance (effective date July 1, 1995), a firm’s interim report should contain an explanatory statement and an accounts statement [see HSE Cooperative (1995, p. 40) for the Resolution of the Ministry of Finance]. Furthermore, §3 of the Resolution stipulates the content of accounts statements in detail, to include numerical disclosures, where appropriate, for (op. cit., p. 39): (1) all main income statement components, other income and expense

components reported without netting; (2) major assets and liabilities together with appropriations; (3) investments; (4) number of personnel; (5) order backlog and evaluation of principal risks; and (6) commitments and contingencies, including those for financial derivatives.

As in the U.S.A. and Sweden, Finnish financial analysts have provided some recommendations covering interim reports (Association of Finnish Investment Analysts, 1992). It should be mentioned that, normally, Finnish interim reports are not audited separately. However, the Securities Markets Act (Chapter 2, §6) stipulates that annual accounts should include an auditors' statement on the correctness of the firm's interim reports for the same year. For a recent discussion of the role of auditors in Finnish interim reporting, see Luoma (1994).

4.2.4. Comparison between Finland, the U.S.A., and Sweden

Basically, interim reporting regulation is fairly similar in Finland, the U.S., and Sweden. In all three countries, interim reporting is required to be comparable to the concepts and terms applied in the firm's previous annual report. Therefore, there is a general requirement that interim reporting should complement annual reporting by providing the user with up-to-date information, stated in the same financial terms as the immediately preceding annual financial statement. In normal cases, interim reports do not have to be audited or reviewed by an external accountant. One common feature in all three countries is the ad hoc response of firms to additional recommendations made by unofficial user groups, such as financial analysts.

The regulation of interim reporting in the U.S.A. differs somewhat from that in Finland. One technical difference is that in the U.S.A. SEC filing imposes a particular format. In Finland and Sweden, special filing formats exist only for the banking and insurance sectors. This may be a reflection of the fact that different organs are charged with monitoring firms in the three countries; in the U.S.A. it is primarily the SEC and in Finland and in Sweden it is mainly the stock exchange.

Another difference is the frequency of reporting. In the U.S.A., quarterly interim reporting dominates. In Finland and in Sweden, the required reporting frequency is lower. However, many Finnish firms publish more than one interim report per year. Recent statistics by the HSE (archival list No. 12-03, date: December 13, 1995) show that 74% of HSE-listed firms published at least two interim reports in 1995. In Sweden 80% of SSE-listed (A list) firms published quarterly reports in 1995 (this figure was kindly obtained from Mr. Hans Edenhammar of the SSE).

5. Research hypotheses and outline of the empirical investigation

This chapter derives the research hypotheses based on prior literature, firm attributes, and the development of the institutional regime. The research hypotheses related to the determinants and implications of interim reports are stated in sections 5.1 and 5.2 respectively.

5.1. Hypotheses of the determinants of the information in interim reports

It is hypothesized that the following nine properties affect the general disclosure in interim reports: (1) governance structure, (2) business risk, (3) market risk, (4) capital structure, (5) stock valuation, (6) firm growth, (7) growth potential, (8) firm size, and (9) yearly dichotomy variables representing the maturity of the market. The reasoning for the inclusion of these properties is discussed below.

5.1.1. Governance structure

Governance refers here to the ownership structure of a firm's shares. It is argued that a firm's ownership composition is reflected in its business communication and might also influence the structure of the firm's interim reports. The theory is that a firm's monitoring principles might depend upon variables such as the number of seats on the board and the ownership structure. The relationship of governance and the mode of communication is complex. For example, a seat on the board might allow faster, more confidential information transfers between managers and owners than would be possible, or even prudent, via interim reports, with their wider circulation. Because of

the existence of alternative communication channels, it is not always unambiguous how a firm's governance structure affects disclosure.

Despite its complexity, the ownership structure might be reflected in a perceptible manner in the interim reporting. Reporting policies might be affected by the sophistication of the investors. The existence of institutional investors as majority shareholders might lead to different disclosure policies from those of firms whose owners are mainly non-institutional. In this study there is an expectation in respect of the direction of the hypothesis only for the non-institutional ownership group. We hypothesize that the greater their ownership of a firm the greater is that firm's level of disclosure.

Furthermore, Kim and Verrecchia (1994) have shown theoretically that certain levels of disclosure may attract information processors (institutional investors and other market experts that may follow a firm closely, e.g. large shareholders, financial analysts, and managers of competing firms). This, in turn, may increase the information asymmetry between subsets of traders because certain traders can make superior judgments about a firm's performance compared to other traders. This distinction between sophisticated and unsophisticated investors has also been applied empirically by others (Hand, 1990; Potter, 1992).

5.1.2. Business risk

The second property believed to be related to disclosure is the firm's business risk. The interpretation of this property is fairly straightforward. The higher the firm's

business risk, the higher the level of disclosure it should have. This statement presumes that interim reports are used to some extent to monitor a firm's operations.

5.1.3. Market risk

The third property, market risk, refers to conventional market risk as measured by beta. If a firm's market (undiversifiable) risk is high, its share price is more sensitive to market movements than shares in general. This sensitivity should induce high-beta firms to pursue an extended disclosure policy. In order to assist investors in their evaluation of the firm and its prospects, it is in the interest of managers of high-risk firms to communicate firm-specific and potentially industry-specific information in their interim reports. Prior literature also shows that securities where only a small amount of information is available have a higher systematic risk than shares with a greater amount of information available (Barry & Brown, 1985, 1986). Beta can be related to the cost of equity capital. Dhaliwal, Spicer, and Vickrey (1979) find that an increase in disclosure (segmental disclosure requirement) decreases the cost of equity capital.

5.1.4. Capital structure

The fourth property, capital structure, is also believed to affect a firm's voluntary disclosure. Debt holders have explicit contracts that the firm must honor. These fixed obligations have implications for shareholders. Especially when a firm's debt/equity ratio is high, its shareholders should monitor the firm's operations so that the rights of the shareholders are not overlooked. The sign of the relation between disclosure and capital structure is somewhat ambiguous. The reason for this is the existence of free

cash flows. When there is a large amount of free cash flow, managers might use the free cash flow in a way which the owners would not want. Debt contracts can be interpreted as one way to reduce the prospects of such misuse. Organizational efficiency, therefore, can be enhanced via the judicious use of debt. In this sense, debt can be seen as being efficient for managers and their organizations (Jensen, 1986, p. 324). If the markets interpret debt contracts as protection against the misuse of free cash flow, then the owners might not feel as compelled to institute monitoring.

5.1.5. Stock valuation

There are solid grounds for arguing that the fifth property, stock valuation, is related to disclosure. The intuition is that when managers view a firm's stock as mispriced they ought to have an incentive to correct the aberration (Healy & Palepu, 1993, 1995; Healy, Palepu, & Sweeney, 1995). Choi (1973b) derives a conceptual framework relating disclosure improvement to the cost of capital. It is shown that increased firm disclosure allows a more precise estimation of a security's expected return streams (op. cit., p. 289). When stocks are undervalued: (1) there should be high incentives for informed market participants to purchase, (2) underpriced firms become potential targets for takeover, and (3) if a firm's share price has implications for remuneration, managers should be interested in eliminating such undervaluation. Undervaluation also works against current shareholders. First, the value of their property is underpriced and therefore new owners are able to buy shares cheaper. Second, the acquisition of new equity capital might be difficult and will be more expensive when share prices are undervalued. All of these eventualities lead to increased demand for the shares, thus driving the price up to its true value. Management should seek to expand disclosure in an effort to speed the process of adjustment.

High overpricing of existing shares should also induce managers to extend disclosure. This is especially true when the potential drop in share prices is so significant that possible legal action against management might ensue (Francis, Philbrick, & Schipper, 1994). All of this argues that either overpricing or underpricing leads to increased disclosure. The focus of the present study is the effect on disclosure of potential undervaluation.

5.1.6. Growth and growth potential

As regards the sixth and seventh properties, growth and growth potential, there is recent evidence for a relationship between some firm-specific fundamentals and stock returns (Chan, Hamao, & Lakonishok, 1993; Dennis, Perfect, Snow, & Wiles, 1995; Fama & French, 1992). Somewhat contrary results are reported by Kothari, Shanken, and Sloan (1995). Therefore, certain carefully selected fundamentals were investigated to establish whether they contained information related to corporate growth and growth potential. The assumption is that managers, who have superior information compared to outside investors, will inform interested investors of the firm's growth potential by extending disclosure.

5.1.7. Firm size

The eighth property, size, is included because several papers have unambiguously documented that large firms have a higher degree of disclosure than small firms (Cerf, 1961; Chow & Wong-Boren, 1987; Giner Inchausti, 1993, April; Lang & Lundholm, 1993). Size is included as an explanatory variable to capture this influence.

In addition, Freeman (1987) states that differences between large and small firms affect investors' information search costs. Operational complexities are said to be a notable cause of differences in these costs. However, as suggested by Freeman, certain initiation costs may be mitigated with firm size. This is because large firms normally have a public or investor relations department anyway that supplies published accounting information.

It has also been reported that the degree of a share price revaluation in response to earnings announcements is inversely related to the firm's size (Atiase, 1985). This finding is attributed to differential levels of predisclosure information production and dissemination by different sizes of firms. It may well be that large firms especially take this into account already during the predisclosure period. This kind of disclosure policy helps to bring together the desire of investors for information on a firm and the firm's actual communication during the predisclosure period. Firms with a responsive predisclosure communication policy are likely to be equally investor-friendly in their interim report disclosures. These are the main reasons why size is included as an explanatory variable.

5.1.8. Market maturity

The ninth property is designed to capture the impact of regulation and other aspects of the development of the HSE during the research period. One of the indications of this development is the rapid increase in the stock exchange turnover in HSE-listed firms, especially in the second half of the 1980s (for more details, see Helsinki Stock Exchange, 1995, p. 66). By their nature, regulation and other factors reflecting the development of the HSE can be characterized as qualitative rather than quantitative.

Changes associated with aspects of the regulatory environment or other advances are measured by the use of a yearly dichotomy variable.

The following is a summary of the nine properties affecting disclosure that are identified in this study. The hypothesized direction, where applicable, which an increase in each variable exercises relative to disclosure is stated in parentheses. The model for the determinants of disclosure is as follows:

$$\text{disclosure} = f[\text{number of shareholders (+), degree of institutional ownership, degree of non-institutional ownership (+), business risk (+), market risk (+), capital structure, mispricing (+), firm growth (+), growth potential (+), firm size (+), market maturity (+)}]. \quad (1)$$

5.2. Identification of the independent variables determining the implications of interim reports

Besides the determinants of interim reports, the implications of those reports for the market are studied. Since Ball and Brown (1968), there has been accumulating evidence that earnings contain useful information to the stock market. However, our knowledge of the information content of other disclosed information, besides earnings, is much more limited. This includes the relationship of earnings and other disclosed information.

There are some reasons that partly explain the lack of disclosure studies in the stock market context. First, compared to the relationship between prices and earnings, the theoretical definition of the relationship between prices and disclosures is somewhat insufficient. This makes refined statements of hypotheses theoretically very difficult.

Hypotheses in the area of disclosure are usually based on information asymmetries between managers and outside interest groups, especially investors, and how these asymmetries affect the disclosure behavior of management.

Second, the measurement of disclosure is more complicated than that of earnings. This can be attributed to the multidimensional nature of disclosure relative to the more unidimensional nature of earnings. To illustrate this, earnings that are favorable for the firm are usually also good news for its shareholders because they increase the firm's ability to pay dividends. With disclosure, however, the value to shareholders is not always as unequivocal as with earnings. In practice, this can lead to a lack of adequately specified hypotheses about the direction that a certain disclosure will have on prices.

The construction of the hypothesis for the implications of disclosure should be seen in the light of existing returns/earnings literature. The question of whether disclosure contains any incremental information for the market over that captured via earnings is studied. This incremental information is believed to exercise an influence over: (1) earnings response coefficients, ERCs; (2) cumulative abnormal returns, CARs; and (3) bid-ask spreads.

Different firms may have varying disclosure strategies besides the disclosure practice observed in their interim reports. These possible differences in disclosure strategies should be taken into account and controlled for. In this study, therefore, ERCs are computed for both: (1) a set of return periods ending before the event and (2) a set of

return periods including the event. This isolates any change in ERC values which are due to the event itself.

The CAR function is structured such that CAR is the dependent variable and both earnings and disclosure are independent variables estimated around the event. The CAR study is based on the impact of disclosed information using several return window specifications around the event.

In this study, estimated returns are both market- and risk-adjusted and are determined by the market model. Brown and Warner (1980, p. 249) find that complicated methods used in event studies might even give worse results than simple methods:

A “bottom line” that emerges from our study is this: beyond a simple, one-factor market model, there is no evidence that more complicated methodologies convey any benefit. In fact, we have presented evidence that more complicated methodologies can actually make the researcher worse off, both compared to the market model and to even simpler methods, like Mean Adjusted Returns, which make no explicit risk adjustment.

Brown and Warner (1985) confirm the results of Brown and Warner (1980) using daily data.

In this context, the reliability of the pricing of the HSE deserves mention (see also Martikainen, 1990, appendix 10). Berglund and Wahlroos (1985) study the efficiency of the Finnish market for rights issues. They find no evidence of significant departures from market efficiency between 1977 and 1981. In a study on the Finnish tax environment, Kannianen and Kurikka (1984) report that the tax system affects the

behavior of the stock market. They find that additional tax burdens have no influence on stock prices. According to the authors, one potential reason for this is the Finnish practice of allowing the deduction of the real cost of capital (op. cit., p. 147). However, Finnish dividends and taxes are calculated on a firm's annual earnings. Therefore, managers can more freely report the actual operating result in interim reports without direct dividend or tax consequences.

Recent evidence also shows that, according to the abnormal performance index (API), the pricing of the HSE is consistent with results reported for major foreign exchanges. Over the period (-50, 10) business days relative to the interim report's announcement day (0), a statistically significant difference exists between the mean of positive and the mean of negative API portfolios. The highest difference between a negative and positive API is obtained using window (-3, 7) in the research period 1986-89 (Schadewitz, 1992).

Based on previous studies, it has been established that bid-ask spreads reflect information asymmetry between managers and investors. Lev (1988) suggests that information asymmetry in the capital markets leads to wide bid-ask spreads. This is empirically verified by Greenstein and Sami (1994). In this study, it is argued that a high level of disclosure decreases the bid-ask spread that exists after the event. Narrow windows are applied in the spread part of the work.

5.3. Outline of the empirical investigation

This subsection outlines the major steps that are followed in the empirical investigation. A detailed description follows in *Part two: Empirical evidence*. Because

there is no readily available interim reporting database, one is compiled. The construction of the database is described in chapter 6. Chapter 6 also reports the collection of other necessary data, based on: (1) annual financial statements, (2) governance data, and (3) stock market data.

The major stages in the construction of the interim report database include: (1) a definition of required interim report information, (2) collection of actual interim reports, (3) completion of disclosure scoresheets, and (4) input of interim report information to the appropriate computer software. The guidelines used in this portion of the study are found in prior literature. Data previously collected by Schadewitz (1992) cover the period 1985-90. A pilot study of these data tested the suitability of the formula for use in the finalized disclosure scoresheet. Finally, the data collection was extended to cover the period 1985-93.

After finalizing the interim reporting data collection, the disclosure scoresheets were completed. The interim report-specific disclosure scoresheets were then recorded as part of the database. Some additional financial statement information, based on interim reports, was also recorded.

The following principal classes of data were required for this study: (1) quantitative, from interim reports; (2) qualitative, from interim reports; (3) quantitative, from annual reports; and (4) quantitative, from share prices. Since no databases providing all the data necessary for this research were available, appropriate databases were constructed. Primary data, consisting of a qualitative analysis of interim reports and quantitative data extracted from those reports, were first compiled. Existing disclosure

databases, maintained by both the Helsinki School of Economics and Business Administration (hereafter the Helsinki School of Economics and Business) and the University of Oulu, were utilized for cross-checking where possible. The Helsinki School of Economics and Business also maintains a quantitative database constructed from annual reports. A final data set was required from the stock market. Those data were available from the Helsinki School of Economics and Business. Thus, all the data not based on interim reports were available from secondary sources. Details of: (1) the process of determination of the primary data entries, (2) the verification of the secondary data sources, (3) the merger procedures, and (4) the interpretation of the data are given in the next three chapters.

Governance data were not available in a database form. Therefore, that information was collected from other publications. These are mainly Kansallis-Osake-Pankki annual publications. These data were merged into the expanded, now complete database. Appropriate checks were performed at every stage to ensure that all the desired data had been collected once and only once and that only the desired data were included in the databases.

Part two
Empirical evidence

6. Data sources

This part (*Part two: Empirical evidence*) of the work contains data, methods, and results related to the determinants and implications of the information disclosed in interim reports. To make the presentation as fluent and precise as possible, the data are presented here in chapter 6. The major reason for this is that the methods applied in the determinants part and in the implications part of the study are different. Therefore, chapter 7 describes the methods and results for the determinants part of the study. Chapter 8 contains the methods and results for the implications part of the study. The benefit of this type of structure is that the reader can find in one chapter the methods and results of either the determinants part (chapter 7) or the implications part (chapter 8) of the study. This type of organizational structure also minimizes the amount of cross-referencing. In addition, the reader can find a description of the data and their preparation in one chapter (chapter 6).

6.1. Accounting data

6.1.1. Period studied

The measures of disclosure are based directly on original interim reports covering the period 1985-93. The data comprise practically all the interim reports published by the firms listed on the HSE during that period. The finance and insurance sectors are excluded, due to the variability: (1) among reporting firms and (2) within reporting firms over time. A similar exclusion practice is followed by Niskanen (1990, p. 48).

Although some Finnish firms published interim reports before 1985, calendar year 1985 is selected as the starting year for this research. There are two major reasons for this. One reason is that systematic filing of interim reports by the HSE began in 1985. This starting point provides a base from which to compare the impact of interim reporting regulations, which commenced in January of 1986. These initial regulations were the subject of public comment as early as 1985. *Kauppalehti* (July 24, 1985, p. 3) contains an article entitled: "Käytäntö selkiytyy: tulostiedot myös osavuositarkastuksessa" [Disclosure practice to be clarified: earnings information to be disclosed also in interim reports]. Professional journals in Finland also contained articles dealing with the information requirements of interim reports (Koskelainen, 1986).

The second reason for selecting 1985 as the starting year is pragmatic. Empirical experience related to data collection indicates that the longer the time since the announcement of the interim report, the harder it is to obtain the original report. The interim reports required for this research are practically no longer available for years earlier than 1985. The primary aim of this research is to construct a database from original interim reports. In a few cases it was even impossible to obtain interim reports for the current research period of 1985-93.

Disclosure databases constructed by the Helsinki School of Economics and Business and the University of Oulu record the history of interim reporting within the HSE. These databases provide some information on the period prior to regulation, though not in the detail required by this research. The Helsinki School of Economics and Business databases were generated from information provided by *Helsingin Sanomat*.

They cover the years 1970-93. The University of Oulu database is a subset based on *Helsingin Sanomat*, covering the years 1973-85.

From 1970 through 1984, about 200 interim reports were published by listed firms, excluding the finance and insurance sectors. Of these, less than 80 were published in the 1970s. Almost 130 cover the much shorter period 1980 through 1984. It is clear that a trend toward greater disclosure frequency preceded the period in which statutory requirements demanded increased disclosure frequency.

6.1.2. Sample firms

A protocol was used to ensure that all listed firms, excluding the finance and insurance sectors, were included in the study. Accordingly, a follow-up document was prepared for each year, containing the name of all firms listed on the HSE at the beginning of the year. This document also contained changes in the listing status of those firms plus any additions to the list during that year.

All the available interim reports were then entered on a list appending the protocol. If no interim report was available for a firm on the list, the missing report was requested from that firm. These inquiries were recorded and are described in appendix B (item No. 8), which contains the primary accounting data sources. If a particular interim report was not received even after an intensive search, it was excluded from the study. In the end, only 14 interim reports remained unavailable. Because those reports were published by 11 firms, this deficit should cause practically no bias in the results.

The data primarily collected and used from the interim financial statements are group data. If group-level information was not available, then parent company or divisional information was used. This order of priority was followed so as to have information relating to the firm as a whole. In a few cases, only parent company information was reported. Usually, the reason indicated by the firm for that kind of policy was the minor significance of the daughter firms to the business unit as a whole. The importance of group-level information is also recognized in the HSE's regulation. In the January 1, 1990 (effective date) rules and regulations it is explicitly mentioned that, if a firm is obliged to publish group-level annual accounts, it should also prepare and publish corresponding interim report information (HSE Cooperative, 1991, p. 24). Because reports containing parent firm information only were very rare, they are unlikely to cause any bias in the results.

The vast majority of the sample firms applied Finnish accounting (FA) standards in their interim financial statement preparation. Some firms simultaneously reported numbers according to both FA and international accounting (IA) standards. In those cases, the FA numbers were used in this research. A few Finnish firms report IA numbers only in their financial statements (less than 7% of the interim reports evaluated). In those cases, the numbers were adjusted, as far as possible, to match FA numbers. In practice, the minority interests component was reallocated to resemble more the FA allocation. The IA component share of profits in associated companies was not reallocated due to the insufficient information available in the interim reports.

An inquiry covering years 1985-90 was undertaken amongst the sample firms to obtain more information about some of the accounting principles and practices applied

in interim financial statements. The themes of that inquiry were: (1) depreciation policy, (2) appropriations, (3) consolidation practice, and (4) currency translations. The inquiry revealed that one clear difference between interim and annual financial statements was in the treatment of appropriations. No appropriations were made in interim financial statements. A more detailed interpretation of the inquiry is reported by Schadewitz (1992, pp. 102-103). Finally, it should be mentioned that all the databases compiled by the author have been archived. These data files make it possible: (1) to verify the final data applied in the further stages of this research and (2) to confirm that the statistical programs use the data appropriately.

6.1.3. *Defining event date*

Precise definition of the event date is critical to this study. Fig. 1 below illustrates an actual example of how misspecification of the event day may give biased results. The news media involved are intentionally withheld. Permission to refer to an announcement by an HSE-listed firm, the Rautaruukki Group, was kindly given by Vice President of Corporate Communication, Mr. Esko Lukkari. The actual events and media commentary were as follows. One, Rautaruukki published its eight-month interim report on 18.10.1991, a Friday. Earnings were sharply down. Two, *newspaper A* commented on the announcement the next day, 19.10.1991, a Saturday. Three, *newspaper B* commented on the announcement the following Monday, 21.10.1991.

To illustrate how the date decided upon as the event date may introduce bias into the result, observe that in this case there are but three logical event dates: (1) the date of the announcement by the firm, (2) the response by *newspaper A*, and (3) the response by *newspaper B*. Only one of these, (1), represents an unbiased measure of the result.

Fig. 1 below shows that the market reacts very strongly to the significant earnings decrease which the firm discloses in its report and this stresses the importance of precision in defining event dates. The earnings decline, or its magnitude, must have been unexpected, because the event causes a highly negative abnormal return. The correct event day (0) is the date of the announcement (18.10.1991) by the firm and is therefore used in this study. This example also demonstrates the need to seriously consider how to define the actual event day when the only source of dates is a newspaper or other nonfirm medium. The adjustment process used in this particular study is described below.

The final event day was controlled by applying multiple, independent data sources. In normal cases, the following procedure was used. Some interim reports, or their cover letters, state the date on which the firm officially announced the report. In those cases, the official announcement day was used as the event day. Failing that, the primary source of event dates was the date on which the interim financial statements were registered as received at the HSE. The HSE has some interim reporting material on file for 1985. However, this information is so limited that *Kauppalehti* newspapers were systematically used to supplement the files. The HSE began systematic collection of interim reports in 1986.

To attain maximum credibility for the event dates selected, especially for 1985, event day information was compared with several data sources. The data sources for 1985 were: (1) the official archives of the HSE; (2) the disclosure database of the Helsinki School of Economics and Business, based on *Helsingin Sanomat*; (3) *Kauppalehti*; and (4) the disclosure database of the University of Oulu, based on *Helsingin*

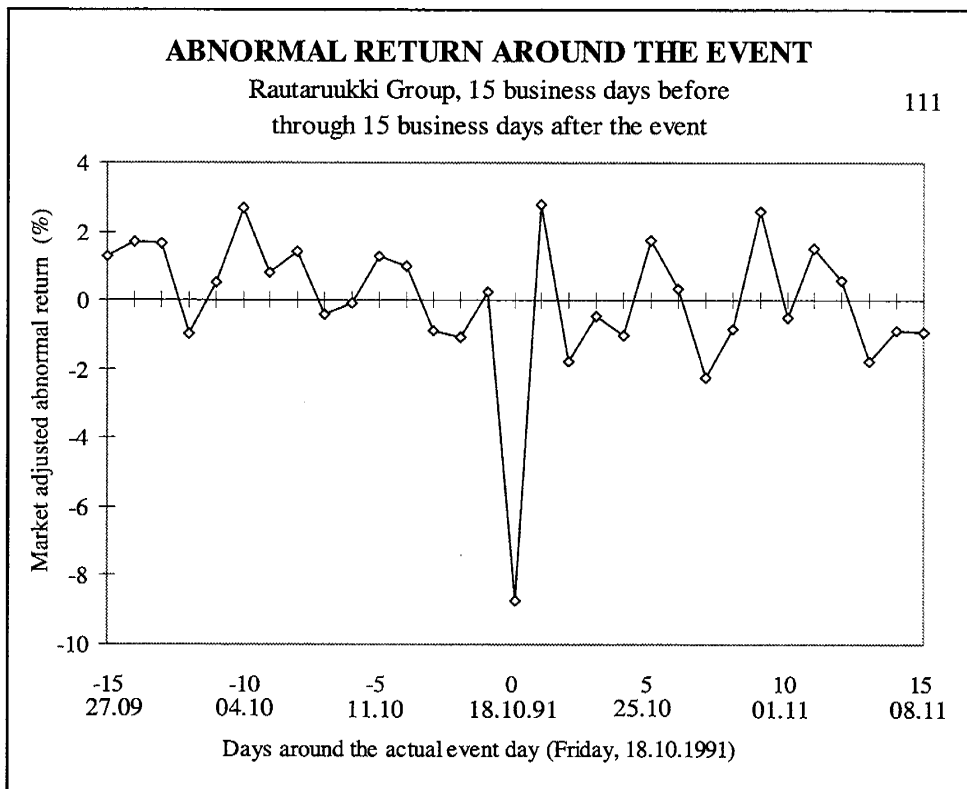


Figure 1. Abnormal return behavior around the event. The abnormal return is the deviation between a firm's share return and the return of a value-weighted market index. The event is the publication of an eight-month (January - August, 1991) interim report by an HSE-listed firm, the Rautaruukki Group.

Sanomat. Comparison between event days was possible because all the event days originating from these data sources were collated into a merged database. Systematic comparison of the event days indicated that, in many cases, the newspapers had a one-day reporting lag relative to the actual announcement. Therefore, when the source of the event day was a newspaper, the previous business day was used as the event day. In addition, when there was uncertainty about the exact event day, the interim report was consulted to find any indirect indication of the event date. If event-day information was available from several sources, the earliest date was applied. Abdel-

khalik (1984) discusses evidence related to the use of the *Wall Street Journal* as a valid source of event dates.

Where the disclosure database in the Helsinki School of Economics and Business indicated that the validity of an event date might be in doubt, it was checked from the original news item in *Helsingin Sanomat*. All of these individual tests were transcribed and filed. If an incorrect event day was identified, it was not used in this study.

For the period 1986-87, the data sources for event dates were almost the same as those for 1985. However, the disclosure database of the University of Oulu only covers the period 1973-85, so it could not be used for the entire research period. For 1986 and 1987, *Kauppalehti* is available on microfilm. Because there was already one comparison between the primary source of event dates (HSE archives) and the disclosure database of the Helsinki School of Economics and Business, it was decided to go through the stock market pages in each copy of *Kauppalehti* for 1986-87, exclusively.

For reports from 1988 onwards, the event days in the different data sources were cross-checked in a similar manner to the previous year. However, two technical advances made the search easier. First, primary event dates were available from the HSE through their archival program (see appendix B for archival printouts used). In addition, *Kauppalehti* search data for 1988 onwards are available on a computer program. In a few cases, an interim report is available, but the event day is unknown. In those situations, the *Kauppalehti* search was repeated around the likely event time.

If that search did not reveal the event date, then the missing event date was requested from the HSE or from the firm itself.

The final outcome of this lengthy procedure was that 92.6 percent of the available event dates are based on information from the HSE or from the firms themselves. A further 4.2 percent were obtained from *Helsingin Sanomat*. The remaining 3.2 percent of the final event dates were taken from *Kaupparehti*. Reporting lags, defined as the number of business days from the end of the interim reporting period to the event, are given in appendix E.

It should also be mentioned that some basic statistics give independent support to the conclusion that the vast majority of the event days applied are very precise. For example, the standard deviation of returns during the period (-30, 1) business days is highest at event day zero. A high level of standard deviation of returns remains for several days after the event.

6.1.4. Disclosure variables

In section 5.1 above, disclosure is stated to be related to: (1) governance structure, (2) business risk, (3) market risk, (4) capital structure, (5) stock valuation, (6) firm growth, (7) growth potential, (8) firm size, and (9) the maturity of the market. The empirical counterparts of these theoretical firm attributes are presented below.

6.1.4.1. Governance structure

Corporate governance was approximated by the number of owners and the composition of ownership as between different types of owners (see also Pohjola,

1988, for a study on the concentration of shareholder voting power in Finnish industrial companies). *Number of shareholders*, LHOLNU, during the event year indicates how many shareholders a firm has. A natural logarithm format was applied in an attempt to avoid the possibility of extreme values contaminating the results. Besides the number of shareholders, the composition of the shareholders was studied in order to establish whether this had any impact on the disclosure. The degree of ownership by institutions was divided into four groups and measured as the percentage of ownership by these groups: (1) *foundations and associations*, ASSOC; (2) *firms*, FIRMS; (3) *banks*, BANKS; and (4) *insurance companies*, INSUR. There may be alternative communication channels, such as a seat on the board. Because of this, it is not unequivocal how these four ownership groups affect disclosure. The degree of non-institutional ownership is measured as *the percentage of ownership by individuals*, INDIV. Individual owners do not usually have alternative information sources from a firm. Therefore it is hypothesized that firms with a large proportion of individual owners practice a high degree of disclosure. Besides these five variables for the ownership groups, there is a further group for “other” owners.

The Kansallis-Osake-Pankki annual publication entitled: *Listed companies in Finland* (Kansallis-Osake-Pankki, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993) was a primary source of these figures.

6.1.4.2. Business risk

A firm’s risk in relation to its operations was mainly approximated by variables derived from income statement components disclosed in interim reports. Variations in the values of income statement components were applied as a business risk measure.

The variance measurement used is standard deviation (Francis, Philbrick, & Schipper, 1995, June). Six measures are used. Due to the lack of sufficiently long accounting data series, a single standard deviation value was estimated for each firm for the whole research period.

The first measure is *standard deviation of the percentage change in net sales*: SCGNETS. It is assumed that higher values of SCGNETS demonstrate higher business risk, indicating that the more a firm's net sales vary, the higher is its business risk. The second measure is the *standard deviation of the profit/net sales ratio*: SPROFNTP. The ratio of profit to net sales indicates the firm's earnings after the costs of its normal operations (i.e. without extraordinary items). The more the values of this variable vary, the higher the business risk was considered to be. The third and fourth measures of business risk are ratios containing comparisons of the current and previous year's figures. It was assumed that the greater the variation in changes in those ratios, the higher business risk is also. The third ratio is *standard deviation of the percentage change in profit after financial items*: SCGPROFI. This indicates the degree of variation in a firm's intertemporal earnings generation. The fourth variable is *standard deviation of the percentage change in profit after financial items/net sales ratio*: SCGNETPR. This denotes a firm's earnings generation over the years. Possible changes in the level of net sales are eliminated by deflating profit with net sales. These four business risk variables are all derived from interim reports.

The fifth business risk variable is traced from the annual income statement. It is *standard deviation of the percentage change in annual net sales*: SANNETSP. This variable is included in an effort to identify any distortion caused by seasonality in

earnings or cost figures. The primary source of annual net sales numbers was the TA-Yritysmalli financial database, containing annual financial statement information and ratios for major Finnish firms (TA-Yritysmalli, 1993, p. 7-1):

$$100 * [\text{net sales} - \text{net sales (previous year)}] / \text{net sales (previous year)}.$$

A sixth measure of business risk is the variation in net investments. Intuition argues that large variations in net investments signal the potential of increased business risk (e.g. in terms of investing in new business areas). Variation in investment activity was measured by the *standard deviation of the net investments/total assets* ratio: SNIQKPOP. The values for this ratio originated from the annual financial statement database at the Helsinki School of Economics and Business.

6.1.4.3. Market risk

The third theoretical property affecting a firm's disclosure is argued to be market risk. In this study, market risk is approximated by *beta*: ANNBETA. This measure is based on the market model presented below (Fama, 1976, p. 69):

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it}, \quad (2)$$

where

R_{it} = return on stock i at time t ,

R_{mt} = return on a market portfolio m at time t ,

α_i = intercept for stock i ,

β_i = slope coefficient (market beta) for stock i , and

e_{it} = n.i.d. errors for stock i at time t .

The market index employed is value-weighted. Daily stock returns were applied in the estimation of betas. Where a firm had several share series listed on the HSE, the most frequently traded was selected for the computations. The estimation period was 250 trading days before the event ending 30 business days prior to the event. If there were other interim report announcements for that firm in the estimation period, those announcements were excluded from the beta estimation period. The excluded period was always (-30, 30) business days relative to the event in question. An estimation period of 250 trading days was used because a longer estimation period would have led to the inclusion of more data based on post-event observations (described in more detail later in the text). The estimation periods were modeled on those reported in Mendenhall and Nichols (1988, p. 72).

Because there is no absolute theoretical basis for selecting an appropriate length for the excluded period, the decision to use 61 business days was based on previous research findings. This is because prior results, based on Finnish interim reports, indicate no clearly discernible difference in abnormal return behavior between positive and negative earnings portfolios prior to 30 business days before the event (Schadewitz, 1992, p. 61).

The same study also shows that it would pay to lengthen the window to cover more days after the event than ten business days. This conclusion is based on the observation that, after the event, abnormal performance indices for positive and negative earnings portfolios are still fairly far from each other. It is possible, therefore, that not all the information revealed in the announcement of an interim report is

discounted in prices within a period of ten days. These findings, based on visual observations, are validated by statistical analyses (op. cit., p. 66).

It should be also mentioned that windows exceeding 61 business days would have led to overlaps in successive firm-specific windows. Therefore, the length of the window was close to its maximum already in Schadewitz (1992). Moreover, compared to a (-50, 10) window, a somewhat different window definition relative to the event provides additional insight into return behavior. Therefore, the window around the event was repositioned to cover fewer business days before the event and more business days after the event compared to the above study. For these reasons the final window is (-30, 30) business days around the event. It is logical, therefore, that since (-30, 30) day periods were excluded in the estimation of beta, these same periods were studied in the implications part, investigating the implications of interim reports for the stock markets (section 8.5.2.2 below).

If there was not enough data before the event for a 250 trading day window, the window was extended to cover the requisite number of days in the post-event period. Symmetrically, the pre-event period computations, in cases where the window had to be extended beyond the event, start is 30 business days after the event. This secondary type of procedure was adopted in 13.6 percent of cases. In 29 of the cases (5.1 percent of the total number of computed ANNBETA values), the length of the post-event period exceeds 150 trading days. Due to the relatively small number of cases where the period had to be extended beyond the event, this procedure should not have any major impact on the results. Where more than one share series was traded, the more actively traded share series was applied. This series is very often also the main share

series of the company. It normally has the longest trading history in the firm. Daily stock market data were adjusted for stock dividends and stock splits and are available at the Helsinki School of Economics and Business.

6.1.4.4. Capital structure

The fourth theoretical property associated with disclosure is the firm's capital structure. Two measures were applied to indicate the firm's capital structure: (1) the *debt/equity* ratio, ANNDEBTS; and (2) the ratio of *change in equity/equity before the change*, ISSRATIO. When a firm's debt/equity ratio is high, its shareholders need to monitor the firm's decisions so that the rights of shareholders are not overlooked. This increased need to monitor a firm should result in expanded disclosure unless the debtholders do not monitor the situation carefully. In respect of the ISSRATIO variable, there may be a need for additional disclosure close to equity issues. On the other hand, if a share issue falls at a time of low information asymmetry between management and investors it may not result in expanded disclosure. Therefore theory does not provide unambiguous guidance as to how the ANNDEBTS and ISSRATIO variables influence disclosure. The *debt/equity ratio* is given in the TA financial statement database (TA-Yritysmalli, 1993, p. 7-5):

$$\frac{(\text{debt} - \text{advances received} + \text{unfunded portion of the pension liability})}{(\text{appropriations} + \text{reserves} + \text{equity})}$$

The input for ISSRATIO was also based on the TA-Yritysmalli. However, for this variable one adjustment was made to the published data. Where an increase in equity exceeded the previous amount of equity, the equity increase was divided by the total

equity including the increase. In other words, the increase in equity was not deducted from the denominator. In normal cases this adjustment was not necessary. This procedure eliminated negative values which might otherwise have resulted and was applied in eight cases.

These eight entries were scrutinized in more detail. This investigation revealed that in these particular cases a portion of the new equity issue was entered in firms' restricted equity under items other than capital stock. Because capital stock was the item employed in the computation of ISSRATIO it is possible that the variable, after subtraction of increases in equity, acquired a negative value. The principles that were followed in the entries for restricted equity were inquired from the compilers of the database in question, who informed that the entries followed the principles in the individual firms' audited annual financial statements. It is important to note that the observations for which the above adjustment was made were not included in the final regressions because of a lack of data for some other necessary variables. Therefore, the adjustment had no influence on the results. Negative changes in equity (18 times) were allowed if they were reported as such in the original database.

6.1.4.5. Stock valuation

Stock value is one of the major concerns of a firm's managers. Therefore it is likely that a firm's managers are willing to inform the capital markets of events that will favorably affect the firm's value. This desire should be especially strong where a firm's shares are perceived by management to be undervalued. This potential undervaluation will be tested here.

To study whether stock valuation affects management disclosure practice, pre- and post-event share price performance was included in the determinants model. This approach is in line with Healy and Palepu (1995) and literature cited there. The use of, say, the price/earnings (P/E) ratio would have been distorted by the earnings, whereas the purely stock market-based measure of valuation applied in this study is not. *Pre-event* share price performance was measured by *cumulative abnormal returns* (CARs) covering a 125 business day window (-140, -15) before the event. This variable is called PREBCAR. In the computation of CAR, expected returns are based on the market model.

A symmetrical post-event CAR was measured for a 125 business day period (15, 140) after the event. This variable is referred to as POSBCAR. Where a firm had several share series listed, the most frequently traded series was selected for the computations.

A 250 trading day period, ending 140 business days before the event, was applied in order to estimate the market model parameters for the PREBCAR computation. Here, too, a (-30, 30) business day window was used for elimination of the event in the estimation period. The parameters for POSBCAR were computed employing days before the event and containing a total of 250 trading days. This estimation period ended 30 business days before the event and proceeded backward for 250 trading days. If there were not 250 trading days before the event, trading days were added after the event, starting from business day 30, as discussed in section 6.1.4.3.

The business day period (-14, 14) was excluded from the computations of PREBCAR and POSBCAR in order to avoid the influence of the publication of the interim report

in question. It should be mentioned that the excluded period here is different from the excluded business day period (-30, 30) used in conjunction with ANNBETA. This was in order to capture as much as possible of the implications related to the publication of the interim report, whilst at the same time avoiding any overlaps in successive firm-specific windows.

In the case of the variable PREBCAR (POSBCAR), the end (beginning) of the window is somewhat closer the event than that applied with ANNBETA. This closer event window was used because previous work indicates that no significant relationship exists between CAR and earnings until one week before the event (Kanto & Schadewitz, 1995). Therefore, it is possible to apply windows that end/begin at day -15/15 respectively. This definition excludes two more business weeks in order to eliminate the potential impact of the event not captured by the above study.

6.1.4.6. Firm growth

The sixth theoretical property is related to a firm's growth. The variable is derived directly from the interim reports. It is computed as *percentage change in net sales*: CHGNETS.

Two other growth variables are applied. Both are based on annual financial statements. *Percentage change in annual net sales*, ANNETSP, is applied as one possible proxy for growth (TA-Yritysmalli, 1993, p. 7-1). In addition, the *net investments/total assets* ratio, NIQKPOP, is used to approximate a firm's investment activity. This ratio should be appropriate for measuring a firm's growth in investments, because it indicates the investment level after elimination of replacement

investments, i.e. net investments. The values for this ratio are derived from the annual financial statement database at the Helsinki School of Economics and Business.

6.1.4.7. Growth potential

The measure of a firm's growth potential is the ratio of *book equity value/market equity value*: BMRATIO. Recent studies report that the book-to-market ratio is an important predictor of stock returns (Dennis, Perfect, Snow, & Wiles, 1995; Fama & French, 1992). However, Fama and French (1992, pp. 449-452) find that the precise role of the book-to-market ratio in security analysis remains somewhat unclear. Ryan (1995) seeks to distinguish the variation in book-to-market ratios associated with future abnormal earnings, differences in expected returns, and market mispricing.

The intuition for applying the BMRATIO variable in this study is as follows. Because an information asymmetry situation exists, a firm's managers may notice that the firm's shares are underpriced, with respect to their own view of the value of the firm's growth prospects. As a result of this potential underpricing, the firm's book-to-market ratio will be considered to be relatively too high. Therefore, it is logical for managers to respond to this undervaluation by informing market participants of the situation. One way to do this is to use extended disclosure. The data for this variable are based on the annual financial statement database. The ratio is as follows (see Chan, Hamao, & Lakonishok, 1993, p. 64):

$$\frac{[\textit{shareholders' equity (book value) + reserves (book value)}]}{\textit{capital stock (market value)}}.$$

Book-to-market values are computed from the balance sheet information at the beginning of the interim reporting period. The reason for this is that if managers have an information advantage concerning the firm's growth potential relative to outsiders, and if interim reports are employed to decrease this information asymmetry, then the book-to-market ratio should capture the growth potential. This is especially true when the ratio is measured at the beginning of the interim reporting period. The market value database of the Helsinki School of Economics and Business is the primary source for the required market value of shares in the ratio.

Profitability could also be an indicator of a firm's growth potential. Therefore, three profitability indicators are studied: (1) the *profit/net sales* ratio, PROFNETP; (2) *percentage change in profit after financial items*, CHGPROFI; and (3) the *percentage change in the profit after financial items/net sales* ratio, CGNETPRO. Percentage change is defined as the change relative to the previous year's corresponding interim reporting period. The PROFNETP variable is designed to capture the overall profitability over time. The CHGPROFI and CGNETPRO variables are designed to capture shorter run profitability changes and their potential effects on disclosure.

6.1.4.8. Firm size

The eighth theoretical property affecting disclosure is firm size. Appendix A lists numerous previous studies that report size as an important determinant of disclosure. Besides that, the inclusion of the size variable in the model should control possible departures from normality in the context of certain financial ratios. Perttunen and Martikainen (1989) test empirically the proportionality assumption of financial ratios using Finnish data.

Firm size is approximated by two variables (TA-Yritysmalli, 1993, p. 7-1): (1) *annual net sales*, LANNETRE; and (2) *number of personnel*, LANPERSO. Changes in money values are eliminated from the annual net sales figures by deflating with the appropriate wholesale price index (Statistics Finland, 1995a, p. 12). Distortions caused by potential extreme values are eliminated by the use of the natural logarithm format.

6.1.4.9. Summary of the variables

The variables presented in sections 6.1.4.1 through 6.1.4.8 are summarized below. For the sake of completeness the market maturity variables are also listed. The expected sign of the category in the model in eq. (1) or of the variable itself is given in parentheses.

Governance structure

LHOLNU = natural logarithm of the number of shareholders (+).

Variables representing institutional ownership

ASSOC = percentage of foundation and association ownership,

FIRMS = percentage of corporate ownership,

BANKS = percentage of bank ownership, and

INSUR = percentage of insurance company ownership.

Variable representing non-institutional ownership

INDIV = percentage of ownership by individuals (+).

Business risk (+)

- SCGNETS = standard deviation of the percentage change in net sales,
SPROFNTP = standard deviation of the profit/net sales ratio,
SCGPROFI = standard deviation of the percentage change in profit after financial items,
SCGNETPR = standard deviation of the percentage change in profit after financial items/net sales ratio,
SANNETSP = standard deviation of the percentage change in annual net sales, and
SNIQKPOP = standard deviation of the net investments/total assets ratio.

Market risk (+)

- ANNBETA = market model beta.

Capital structure

- ANNDEBTS = debt/equity ratio, and
ISSRATIO = ratio of change in equity/equity before the change.

Stock valuation (+)

- PREBCAR = pre-event cumulative abnormal return (CAR) at business day -15, and
POSBCAR = post-event cumulative abnormal return (CAR) at business day 140.

Firm growth (+)

- CHGNETS = percentage change in net sales,
ANNNETSP = percentage change in annual net sales, and
NIQKPOP = net investments/total assets ratio.

Growth potential (+)

BMRATIO = ratio of book equity value/market equity value,
PROFNETP = profit/net sales ratio,
CHGPROFI = percentage change in profit after financial items, and
CGNETPRO = percentage change in the profit after financial items/net sales ratio.

Firm size (+)

LANNETRE = natural logarithm of annual net sales, and
LANPERSO = natural logarithm of the number of personnel.

Market maturity (+)

D₈₅ to D₉₂ = yearly dichotomy variables.

The next section will interpret the stock market data and how these will be analyzed further.

6.2. Stock market data

The unexpected returns used in the study are market- and risk-adjusted returns (for the market model, see Fama, 1976, p. 69). Both daily share-specific indices and the value-weighted market index are used in the computation of market- and risk-adjusted returns. Returns on individual stocks are measured by logarithmic price differences adjusted for cash dividends, stock dividends, right issues, and other causes of changes in the number of outstanding shares. It is also assumed that all proceeds from a given stock are reinvested in the same stock at zero transaction costs. Market returns are measured against a value-weighted market index, similar to that presented by

Berglund, Wahlroos, and Grandell (1983). The latest available data in this particular database extend to the end of 1990.

From the beginning of 1991 the Berglund et al. database was merged with stock market data, where the normal adjustments for cash dividends, stock dividends, right issues etc. were made at the University of Tampere. The stock index series in the new database were adjusted with a share-specific scaling factor and then added to the share-specific indices in the Berglund et al. database. The scaling factor applied was obtained as follows.

First, an overlapping period of four months (September through December) in 1990 was used to make the indices compatible. It was necessary for the bid and ask quotations for a security in the Berglund et al. database to be identical with the respective bid and ask quotations in the database made at the University of Tampere. After this control had been conducted the scaling factor was computed for the stock-specific index. The scaling factor was a ratio between the stock-specific indices in the two databases (in the Tampere database the share-specific index was an arithmetic average of the bid and ask share indices). The index values for the scaling factor computations were based on a day when the bid and ask quotations matched as described above. From the beginning of 1991 the value-weighted market index applied was obtained from the HSE (HSE Cooperative, 1994). This HSE based market index was likewise appropriately calibrated and then added to the WI market index in the Berglund et al. database. For the database constructed at the University of Tampere the missing bid (ask) share index values were supplemented with previous available bid (ask) share index values for the computation of the share-specific indices. This

procedure is commonly applied in studies of Finnish stock market data (e.g. in Berglund, Liljeblom, & Löflund, 1989; Martikainen, 1990; for a discussion of alternative ways of correcting for missing values, see Kmenta, 1986, pp. 379-388).

The market model was estimated starting 250 trading days before the event and ending 31 business days before the event (see also section 6.1.4 above). In cases where there was a shortage of data before the event for estimation of the market model, the lacking portion was supplemented with post-event material. Other interim report announcements by the same firm were eliminated from the estimation period. In such cases the eliminated period was (-30, 30) business days around the event in question.

Below is a summary of the main data sources utilized:

1. daily stock return index files,
2. market value database,
3. annual reports of the HSE,
4. annual reports of the firms, and
5. *Kauppalehti*.

The next chapter presents the results for the determinants of disclosure.

7. Determinants of the information disclosed in interim reports

7.1. Measures of disclosed information

7.1.1. Index types

This section first briefly repeats the research hypotheses related to the determinants of disclosure. As stated in chapter 5, the level of disclosure is related to the firm's: (1) governance structure, (2) business risk, (3) market risk, (4) capital structure, (5) stock valuation, (6) growth, (7) growth potential, (8) size, and (9) market maturity.

The information in interim reports is approximated by disclosure indices. In this study, two different types of disclosure indices are applied: (1) a disclosure index containing all items, both mandatory and voluntary, DIALL; and (2) a disclosure index containing only those items that are purely voluntary throughout the entire research period, DIVOLPUR. The data schedule for the disclosure scoresheet used together with the criteria for interpretation of a particular scoresheet item or interim report are presented in appendix C.

There are several reasons why this research focuses on the extremes represented by the DIALL and DIVOLPUR indices. The first reason is the lack of any study reporting results related to disclosure policy in Finnish interim reports. The only reference, besides the studies where the author of this work is coauthor, is Laitinen (1994). His study covers the years 1990 and 1991.

In this context it should be mentioned that the present study adds to the author's previous coauthored papers (Kanto & Schadewitz, 1995; Schadewitz & Vieru, 1993) in several ways. The Schadewitz and Vieru (1993) paper focuses solely on the market risk pattern around announcements of interim reports. The research was conducted on a small subsample of the present work. Kanto and Schadewitz (1995) employ actual earnings and actual disclosure rather than the unexpected forms of the earnings and disclosure variables in the present research. Also, the disclosure index, statistical methods, and return window periods are different from Kanto and Schadewitz (1995). More details of these differences are given in section 8.2 below.

Even research focusing on other aspects of Finnish interim reporting is very limited. Therefore it is appropriate first to provide new insight into how overall reporting has developed over the nine-year research period studied here. The DIALL results serve as a benchmark index for the period 1985-93.

In contrast to DIALL, DIVOLPUR tracks those items that are purely voluntary throughout the whole research period. It is very likely that the regulatory development is reflected in the quality and quantity of the items voluntarily disclosed. Moreover, each mandating protocol is to some degree not stated as an exact item, but is rather described as a class of conditions that should elicit a disclosure. These requirements are easy to overlook or misinterpret. However, when very influential events take place during the reporting period, it is expected that the firm's management would want to report those events. Some of these would be expected to be voluntary disclosures. Therefore, although DIVOLPUR is not entirely without influence from the direct

impact of the regulatory development, this index should be as uninfluenced as possible by the direct effects of the evolution of mandatory disclosure requirements.

7.1.2. Index weighting

It would have been possible to weight the indices by means of a questionnaire directed to analysts. However, the danger was that the responses might have been biased in favor of current practice. Due to the intertemporal nature of the study, therefore, only unweighted indices are applied. The ideal is to obtain a set of disclosures and their importance for analysts that represent weights appropriate for the whole research period. The subjectivity associated with weighting is recognized by Ashton (1974, p. 728):

Generally, individuals overestimate the extent to which they utilize the less important cues and underestimate the extent to which they utilize the more important cues, i.e., “subjective” weights are much more evenly distributed across cues than are statistically-derived weights.

This means that weights may not be reliable indicators of the actual use of information in interim reports. Moreover, some prior studies, such as Cooke (1989b), have ended up applying unweighted indices. In addition, Spero (1979, p. 57) finds that firms disclosing “important items” also consistently do a good job of disclosing “items with minor importance.” More detailed analysis of the benefit of unit weighting schemes can be found in Einhorn and Hogarth (1975).

The databases used in this research, however, are constructed such that each item can be weighted. Both the index and all subindices are automatically adjusted to the

weight selected (see section 7.1.3). This allows for the performance of simulations to analyze the importance of different weighting schemes. Moreover, there is one index construction with a weight option available in the numerator but with an unweighted denominator. This construction should provide the maximum sensitivity for the impact of the weights. This is achieved by eliminating the potential dilution effect associated with a weighting of both the numerator and the denominator.

Another complicating issue related to the use of weights is that the proportionality of index components changes depending on the product of the weight multiplied by the score assigned to an item in the scoresheet. This proportionality is not a problem in this study, because: (1) the indices applied are unweighted and (2) the scores of all the items in the scoresheet are in the interval $[0, 1]$.

7.1.3. Disclosure scoresheet

The maximum number of items in a disclosure index in any year is 26. Appendix C provides a complete list of the items in the index. On the scoresheet, the items are grouped according the concise listing given below (scoresheet item numbers in parentheses):

- A. Management report (items 1 through 9):
 - A.1. Management overview (1-6)
 - A.2. Investments and finance (7-9)

- B. Information in financial statements (items 10 through 26):
 - B.1. Information in general (10-12)
 - B.2. Business segment information (13-14)
 - B.3. Geographical information (15-16)
 - B.4. Disclosure and analysis of components related to financial statements (17-26).

The general construction of the index is that the actual total of points that an interim report receives is divided by the maximum points it would have received by reporting all eligible disclosure items. This makes each ratio an interim report-specific disclosure index. The dichotomous variables 0 and 1 are applied when a particular item is unsuitable for a specific firm. In the scoresheet, these unsuitable items are assigned an X. For more details of this, see section 7.1.3.2 below. The use of dichotomy variables makes the disclosure index impartial for each firm, such that each specific firm is required to report only those items suitable for its operations and state of affairs during the accounting period disclosed in a particular interim report.

DIVOLPUR tracks items that are purely voluntary throughout the whole research period 1985-93. The item numbers in the disclosure scoresheet fulfilling these voluntary criteria are: 2 through 16, 18, 19, and 23 (see also appendix C). In other words, the following eight items were mandatory for at least part of the research period: 1, 17, 20, 21, 22, 24, 25, and 26.

Below is presented the procedure followed in the selection of items for the scoresheet and the principles followed as the scoresheets were filled with firm-specific data.

7.1.3.1. Construction of the scoresheet

The items included in the disclosure scoresheet were to some extent dictated by the legislation governing interim reports. Beyond this, other important guidelines were also followed in the scoresheet construction phase. In the first phase, a literature survey of disclosure indices was performed. This survey is reported as appendix A. Based on this literature search, the initial version of the scoresheet was constructed. Because the disclosure scoresheet was compiled from information based on original interim reports, it is important that the scoresheet was compatible with those interim reports. The importance of pilot work in the construction of an index is emphasized in Oppenheim (1966, p. 100). To obtain additional insight into domestic business communication in general and interim reports in particular, two classes of interview were conducted: (1) the users' view and (2) the producers' view. The author's own knowledge was increased by an inquiry covering the years 1985-90 conducted amongst the sample firms to obtain more information about some of the accounting principles and practices applied in interim financial statements. This inquiry was described in section 6.1.2.

An in-depth discussion was conducted with a professional investment analyst on February 23, 1993. The main objective of that interview was to gain insight into what items are important for analysts in interim reports. In addition, some opinions on current interim reports published by Finnish HSE-listed firms were elicited. A second class of interview involved the process from the producer's viewpoint. This was

accomplished by a discussion with the director of corporate communications of a firm listed both on the HSE and a foreign exchange.

An inventory composed of 146 interim reports from the period 1985-90 provided additional insight. A list of 30 pages of notes on the information obtained was compiled.

An internal report of interest group views related to the development of the HSE was also available to the author (Jääskeläinen & Roine, 1992). That report was based on interviews of representatives of central interest groups for the HSE (24 representatives from Finland and 13 representatives from the U.K., including both users' and producers' views). The aim of the report was to present the original ideas and views of interviewees without filtering them. In addition, published recommendations are available for some user groups (Association of Finnish Investment Analysts, 1992). The disclosure scoresheets applied in the evaluation of corporate financial reporting in the U.S. for 1991-92 provided additional information (AIMR, 1992). The European Federation of Financial Analysts Societies does not have any specific, generally applicable, rating standards for interim reports.

Users value numbers that are backed up by specific analytical comments. The need for such analysis is recognized in prior literature. Shaw (1981, p. 85) states as follows:

In practice, many comments made by companies supplementing numerical disclosure constitute "warnings" to users about placing too much reliance on the predictive quality of interim figures. Such "warnings" at least support the view that stipulated numerical disclosure alone is not enough to provide full

communication between the preparers and users of interim financial statements.

Ball and Foster (1982, p. 199) point out the general lack of analysis of the benefits associated with voluntary disclosure policy by stating: "A heuristic framework of 'more disclosure is better' appears to guide many statements in this area." Some recent studies, say Collins, Davie, and Weetman (1993), also focus on management discussion and analysis. However, the Collins et al. study only quantifies disclosure. They do not directly address the market implications that variations in disclosure may induce (see also Weetman, Collins, & Davie, 1994).

The analysis of interim reporting disclosure policy could be even more important than the analysis of annual reporting disclosure policy. This is due to the potential bias introduced by seasonal fluctuations in such components as net sales and earnings (see section 3.1.3). The present study attempts to accommodate the need for analysis by providing 17 items of the total 26 (65.4%) with an option: (1) item with a few comments or equivalent and (2) item with an analytical discussion or equivalent. The last ten items in the scoresheet (17 - 26) entitled *B.4. Disclosure and analysis of components related to financial statements* include both these two options (see appendix C).

Wallace (1988) compares nine survey studies of disclosure indices. Wallace constructs a standardized list of 41 items, based on the previously reported indices. The items in the new composite index are classified into dominant quartiles, according to the information in the original study (op. cit., pp. 248-250). The most dominating quartile contains 15 items (op. cit., p. 254). The disclosure scoresheet applied in this

study contains the majority of the 15 items that are in the most dominant quartile in the Wallace study. The items in the dominant quartile which are excluded from the scoresheet in this study are taxation and dividends. The natural reason for excluding taxation from the scoresheet in this study is that taxation is not based on interim financial statement information. In addition, dividends are excluded from the scoresheet because Finnish firms only pay dividends annually.

7.1.3.2. Completion of the scoresheet

The scoresheets were filled out by the author using original interim reports in order to minimize the influence of subjectivity and personal opinions (see section 3.2). The information in item 6 (outlook for the remainder of the operating year) was verified by two independent datasets - one by a research assistant and the other by the author. This comparison of the logic of two different datasets was possible because the present extension of the interim reporting database also contains information about firms' annual forecast information of net sales or earnings disclosed in interim report.

If all the 26 scoresheet items applies to a firm, but its report lacks analysis, the disclosure index value for DIALL is 67.3 from a possible 100.0. In this illustration the score assigned to items with an analysis option is 0.5. DIVOLPUR is also influenced unfavorably by a lack of analysis. When all 18 purely voluntary items are eligible for a firm, the disclosure index value for DIVOLPUR is 75.0, a reduction of 25.0 percent from the potential value.

Disclosed items are scored in accordance with the 0.0/1.0 or 0.0/0.5/1.0 system applied by Giner Inchausti (1993, April). If an item is not disclosed, then it is scored

as 0.0. Full disclosure, as defined specifically for a given item, is scored as 1.0. Anything else is assigned the score 0.5, where the item has that option.

There are five exceptions to the 0.0/1.0 or 0.0/0.5/1.0 scoring presented above. Items 13, 14, 15, 16, and 21 are assigned alternative scoring schemes (see appendix C). For items 13 and 14, the scoring is X/0.0/1.0, where the X option indicates that the item is not eligible for that interim report. This alternative procedure is required because the subset deals with the disclosure of business segment information (for recent discussion related to segmental reporting, see International Accounting Standards Committee, 1994). The X option is necessary in order to avoid penalization of a firm for failure to disclose business segments when none exist within that particular firm. Where the X alternative is applied, that item is eliminated by means of a dichotomous variable from the computations for that particular firm. Thus there is no artificial penalty for a firm if an item is not eligible. The information in item 13 (breakdown of turnover or net sales by business segment) and item 14 (breakdown of income by business segment) was in each case systematically verified from the annual *Pörssi tieto* [Review of listed firms on the HSE] publication (Kock, 1984, 1985, 1987, 1988, 1989a, 1989b, 1990, 1992a, 1992b, 1993, 1995).

An X/0.0/0.5/1.0 scoring is used for items 15 and 16. Both of these scoresheet items treat the disclosure of the impact of geographic diversity of a given firm's operations (see appendix C). The X option is required to avoid penalizing a firm for failure to disclose the impact of geographic diversity when there is none. Where the *Pörssi tieto* publication (op. cit. above) reports that a particular firm's exports for a specific year account for at least three percent of total revenues, the research methodology requires

the firm to report geographical information for that year. When a firm's exports are below the three percent threshold, the X option is applied to items 15 and 16.

For cross-checking purposes, an attempt was made to obtain additional information related to each firm's research and development (R&D) activity (item 18). If such information had been available, the X option would have been included in the responses to item 18 in cases where R&D expenditure was minimal for a particular firm. R&D information is systematically monitored by Statistics Finland. However, that information is collected exclusively for internal use and is not revealed to outsiders. If the X option had been used, the lack of adequate information during the compilation of the scoresheet might have caused erroneous judgements about firms' disclosure practice regarding R&D costs. Therefore, item 18 has the options 0.0/0.5/1.0. R&D disclosure evaluations are based solely on the information in interim reports.

The X/0.0/0.5/1.0 scoring scheme is necessary in item 21 because that item measures the disclosure of other income and expenses. The X option avoids penalizing a firm for not reporting the impact of other income and expenses when there are none to report. The criterion is that if other income and expenses for the interim reporting period amounts to five percent or more of the preceding earnings item in the same period, a comment is required. If other income and expenses are less than five percent of the interim period's earnings, the X alternative is applied. To ensure that this procedure was followed properly, the data entries were made by one person and checked by the author. This resembles a control technique presented in Foster (1986, p. 83).

7.2. Schedule for statistical analysis

The disclosure indices DIALL and DIVOLPUR are applied as the dependent variable in their respective analyses [see eq. (1) in chapter 5]. In the multiple regression models, the final combination of independent variables is based on backward elimination (Draper & Smith, 1981, p. 305). In practice, the largest regression model includes all eligible independent variables: (1) governance structure, six each; (2) business risk, six each; (3) market risk, one each; (4) capital structure, two each; (5) stock valuation, two each; (6) firm growth, three each; (7) growth potential, four each; (8) firm size, two each; and (9) market maturity, one dichotomous variable for each year of the study. The final model is constructed so that at least one variable from each variable class is included in the model. Appendix D details the selection of the variables used. Following the practice of Collins and Kothari (1989) and Ettredge, Simon, Smith, and Stone (1994), variables with statistically insignificant coefficients are also reported.

The yearly dichotomy variables are included to account for the impact of regulatory and other HSE-inspired developments, as shown in eq. (1) of chapter 5. The disclosure index scores also reflect the rapid development of interim reporting over the period covered in this study. Therefore there was ample justification for including the yearly dichotomy variables in the model.

Analysis of multicollinearity revealed that, for the final multiple linear regression models, backward elimination did not yield results that were influenced significantly by multicollinearity among any variables. In analyzing multicollinearity, each

independent variable was explained by the remainder of the other independent variables. These analyses are reported in appendix G.

With the dependent variables, some experiments were performed applying logit transformation (Agresti, 1990, p. 81). The use of logit transformation ensured that the disclosure predictions, required in chapter 8, were within the admissible range: [0, 1]. In this study, the disclosure index values for both index types (DIALL and DIVOLPUR) could vary between [0, 1]. The forecasts obtained by the model with logit transformation lay within the admissible interval of 0 to 1. However, the behavior of the error terms better met the requirements of ordinary least squares (OLS) without logit transformation. Because the predictions based on the OLS model without logit transformation were also in the admissible range of 0 to 1, it was decided to perform the final runs using OLS without logit transformation.

Additional tests were performed in order to examine how well the estimated models coincided with the assumptions of OLS. In brief, the underlying assumptions of the regression analysis were as follows (Hald, 1952, p. 627):

1. for every fixed value of independent variables, the dependent variable is conditionally normally distributed,
2. the mean value of dependent variable is a linear function of independent variables,
3. the variance of dependent variable is independent of explanatory variables, and
4. the observations are independent.

The heteroscedasticity of the error terms was examined by means of White's test (White, 1980). In this test, squared error terms are explained by the original regressors, their second moments, and their cross-moments.

The normality of the residual terms was examined by means of the Jarque-Bera test (Jarque & Bera, 1987). The test is based on the skewness and kurtosis of the error term (see also appendix F).

The model applied assume a linear relationship between the dependent and independent variables. Therefore, the potential nonlinearity in the relationship between dependent and independent variables had to be ascertained. The existence of nonlinearity was studied by the regression specification error test (Ramsey, 1969, RESET test). In this test, error terms from a regression are explained using the predicted values raised to the power of two, three, and four. According to Ramsey, the use of these three moments is sufficient (op. cit., p. 362).

7.3. Determinants of disclosure

This section presents the determinants of disclosure. First, the multiple regression results are presented when the dependent variable included all items (DIALL), followed by the results when the dependent variable was based on items that have been purely voluntary over the entire period (DIVOLPUR).

7.3.1. Disclosure results including both mandatory and voluntary information

Table 1 below contains results for the general level of disclosure. The high statistical significance of the *F*-test value (12.36) indicates that the overall model provides

evidence of a linear relationship between DIALL and the explanatory variables. A joint test, where the yearly dichotomy variables were added to the model, yielded $F(7, 234)=3.59$, $p=.001$, indicating that the yearly dichotomy variable is statistically highly significant. The general explanation for this is that in recent years interim reports have established their position as part of listed firms' efforts toward more timely business communication. Later in this section, when the determinants of voluntary disclosure are investigated, it is observed that regulatory developments alone are not an adequate explanation of the rapid development of disclosure.

Next the other tests reported in table 1 are discussed briefly. The heteroscedasticity test (White, 1980) of the error terms indicated that residual variance cannot be forecasted for the DIALL model. The model containing error terms from the DIALL regression gave $\chi^2(121)=103.50$, $p=.873$. The test value indicates that no heteroscedasticity was found in the regression of all interim reports including both mandatory and voluntary disclosures. Table 1 also reports heteroscedasticity-corrected (White, 1980) t values in the rightmost column. An investigation was also performed to see whether the squared error terms and the moments of the predicted values were correlated (another version of the Breusch-Pagan test; Breusch & Pagan, 1979). It was found that the squared error terms and the second moment specification of the predicted values were correlated by $-.139$, $p=.031$. This correlation suggests that the data might be slightly heteroscedastic. Thus, due to the possible heteroscedasticity, predictions of high disclosure were slightly more accurate than predictions of low disclosure. Table 1 shows, however, that t values with standard OLS and those corrected for heteroscedasticity (White, 1980) correspond fairly well with each other.

Table 1. Regression results of all interim reports including both mandatory and voluntary disclosures

Dependent variable: DIALL				
Independent variables	Parameter estimate	Standard error	<i>t</i> value	
			standard	White ^a
D ₈₅	.003	.052		
D ₈₆	.008	.050		
D ₈₇	.019	.051		
D ₈₈	.056	.053		
D ₈₉	.067	.053		
D ₉₀	.090	.051		
D ₉₁	.084	.049		
D ₉₂	.087	.052		
FIRMS	-.001	.000	-1.805	-2.055
SCGNETS	.123	.053	2.326	2.282
SNIQKPOP	.003	.001	3.793	3.427
ANNBETA	-.007	.018	-.353	-.359
ISSRATIO	.026	.018	1.463	1.664
POSBCAR	-.008	.021	-.387	-.444
CHGNETS	-.049	.028	-1.740	-2.115
PROFNETP	-.337	.096	-3.504	-3.626
LANPERSO	.038	.006	6.693	6.045

Adjusted $R^2 = 42.10\%$ $F(16, 234) = 12.36, p = .000$

White:

 $\chi^2(121) = 103.50, p = .873$

Jarque-Bera:

 $\chi^2(2) = 8.09, p = .018$

RESET:

 $F(3, 247) = 1.13, p = .338$

- a = *White* refers to heteroscedasticity-corrected *t* values (White, 1980),
 DIALL = index of all interim reports including both mandatory and voluntary disclosures,
 D₈₅ to D₉₂ = yearly dichotomy variables,
 FIRMS = percentage of corporate ownership,
 SCGNETS = standard deviation of percentage change in net sales,

(for other table footnotes see next page)

Table 1 (continued)

SNIQKPOP	= standard deviation of net investments/total assets ratio,
ANNBETA	= market model beta,
ISSRATIO	= ratio of change in equity/equity before the change,
POSBCAR	= post-event cumulative abnormal return (CAR) at business day 140. Expected returns are based on the market model.
CHGNETS	= percentage change in net sales,
PROFNETP	= profit/net sales ratio, and
LANPERSO	= natural logarithm of the number of personnel.

Boldface (*italic boldface*) designates statistical significance at the 5% (**0.1%**) level.

The normality of the residual terms was examined by the Jarque-Bera test (Jarque & Bera, 1987). The test value for the residuals obtained from the DIALL regression was $\chi^2(2) = 8.09$, $p = .018$. This indicates some degree of deviation from normality. If a more fitting model had been applied, however, it would have caused additional intricacy.

In order to establish whether the nonnormality was due to potential outlier(s), the observations with extreme error residuals were then eliminated. Specifically, the two observations with the highest and the two with the lowest error residuals were eliminated from the data. The Jarque-Bera test value for the residuals obtained from the DIALL regression with these trimmed data was $\chi^2(2) = 2.85$, $p = .241$. It should be noted that all diagnostic test outcomes that yielded insignificant values are deliberately excluded from the text. With the extreme values expunged from the data, the residuals are normally distributed. The screening did not essentially change the t values, and consequently the OLS method was applied to the original data. Furthermore, table 2 in section 7.3.2 shows that the error terms in the DIVOLPUR regression are normally

distributed. This is important, because the prediction of disclosure in chapter 8 is partly based on the DIVOLPUR model.

Finally, the potential nonlinearity in the relationship between the dependent and the independent variables was investigated via the RESET test (Ramsey, 1969). The model containing error terms from the DIALL regression yielded $F(3, 247) = 1.13$, $p = .338$. The test value obtained strongly supports the use of the linear model, instead of a nonlinear alternative.

If an individual firm published several interim reports during the research period, there might be a slight intraclass correlation, indicating that interim reports of one firm would resemble each other. In practice, this potential intraclass correlation will overstate the obtained t values slightly compared to a situation where there is no such correlation (Särndal, Swensson, & Wretman, 1992).

Further analysis of the results obtained with the standard OLS indicated that, in addition to regulation (standard t values): (1) business risk, (2) growth potential, and (3) firm size are clearly related to disclosure. The hypothesized relationship of: (1) governance structure, (2) market risk, (3) capital structure, (4) mispricing, and (5) firm growth was not demonstrated.

The coefficients of the business risk variables (SCGNETS and SNIQKPOP) were both statistically significant. The positive sign of the coefficient of the SCGNETS variable indicates that there is a tendency for extended disclosure when a firm's net sales vary a lot. This outcome is fairly natural, because large changes in a firm's net sales may

influence the operations of the firm as a whole. Changes in net sales may be due to a development that requires explanation by management. It is likely, therefore, that analysis of interim reports will increase during a volatile net sales period. The disclosure index applied in this study is constructed to be sensitive to the analysis section of interim reports (see section 7.1.3 above). The variable approximating variations in a firm's investment activity (SNIQKPOP) also has a positive and highly significant coefficient. This outcome of the model suggests that high variations in investments are positively related to extended disclosure. It is interesting to note that the measure of the investment level, NIQKPOP, does not show up as a significant determinant of disclosure policy. One reason for this might be that some industries have a relatively higher level of investment than others. Thus, it is departures from these levels, as measured by standard deviation, that provide the best indicators, becoming significant elements in disclosure policy. Beyond this, large investments are always a big news item. Consequently, firms tend to make a separate announcement when large investments are decided upon. Such investment items are therefore unlikely to be announced as part of the standard interim reporting cycle. The rapid announcement of investment news, via special bulletins and the news media, is an understandable way to prevent the illegal use of privileged information after an investment decision has been concluded.

A firm's growth potential, PROFNETP, influences a firm's total disclosure in interim reports. Contrary to the prediction, the coefficient of the growth potential variable is negative. One possible interpretation of this outcome is that firms with growth potential, as evidenced by a favorable *profit/net sales* ratio, believe that the ratio in itself is a sufficient indicator of the firm's present and future performance. In other

words, stable, well performing firms may not see any particular need for extended disclosure. The next chapter addresses this issue in more depth, as the relation between: (1) performance, (2) disclosure, and (3) stock market behavior is analyzed.

Finally, because of the covariate nature of the size variable, the results obtained with this variable are presented. The findings of this study concerning firm size are in line with those reported in previous research. The variable measuring firm size (LANPERSO) has a positive and significant coefficient. Because the disclosure index applied also takes into account the degree of analysis in interim reports, the results obtained with the size variable suggest that the interim reports of large firms are also somewhat more analytical than those of small firms. The reason for this may simply be that the business processes of large firms are more complex, demanding greater disclosure. The needs of the users of large firms' interim reports may also be more divergent than those of the users of small firms' reports. These findings confirm those of previous studies, referenced earlier.

It should be mentioned that the coefficient of the governance structure measure, FIRMS, is not statistically significant. Nor are the coefficients of the market risk measure, ANNBETA; the capital structure variable, ISSRATIO; the stock valuation variable, POSBCAR; or of the firm growth variable, CHGNETS.

The insignificant coefficient for the FIRMS variable may be partly due to the increase in the concentration of shareholder power during the second half of the 1980s (Pohjola, 1988). This concentration may also have resulted in additional seat(s) on a firm's board for its major shareholders. A seat, as discussed in section 5.1.1 above,

might facilitate faster, more confidential information transfers between managers and owners than would be possible via interim reports. There is also reported evidence that shareholder concentration may decrease the information asymmetry between managers and shareholders. Douglas and Santerre (1990) find an inverse relationship between stockholder concentration and executive remuneration. According to them, this inverse relationship reflects the reduced information asymmetry accompanying greater stockholder concentration (op. cit., p. 28).

One likely explanation for the insignificance of the coefficient of the capital structure variable is that the relevant information has already been published elsewhere, such as in a share issue prospectus. Myers and Majluf (1984) arrive at the theoretical conclusion that the optimal time to issue shares is when managers and the market share the same information. In the context of the present results, the insignificant coefficient for the ISSRATIO variable may be a function of firms issuing shares during periods of low information asymmetry. Therefore, it can be argued that the ISSRATIO variable does not help to explain disclosure because low information asymmetry exists between managers and the market.

Because foreign listings have been fairly common for HSE-listed firms during the research period, their influence on disclosure behavior was also studied. A dichotomous variable was applied to distinguish those firms listed both on the HSE and a foreign exchange from those that listed solely on the HSE. The results obtained show that there is a positive relationship between disclosure and a foreign listing. However, the validity of the foreign listing dichotomous variable is poor. More detailed analyses revealed that the foreign listing variable is closely related to firm

size. Since size is already taken into account, the foreign listing variable is dropped from subsequent analysis in both the DIALL and DIVOLPUR models.

7.3.2. *Disclosure results involving purely voluntary information*

The second model relates to the determination of purely voluntary items. The definition of purely voluntary disclosure is items that are not explicitly required in any of the years covered in this study (see appendix C). However, every regulation contains a general statement that firms should disclose any extraordinary events affecting their operations. This means that some aspects of disclosure are not explicitly named, but are nonetheless required. This anomaly might be expected to affect the purity of DIVOLPUR. This shortcoming must remain, however, because the information available does not permit a more precise distinction of the mandatory-voluntary dichotomy. This calls for a separate study. The most refined delineation between mandatory and voluntary disclosures would be achieved via the use of a case study approach, focusing on just a few, highly selected firms.

Table 2 below gives additional support for the importance of market maturity in the development of disclosure. Despite the fact that the items in the index applied are not explicitly mandated during the research period, the influence of mandatory disclosure elements at a given time is very strong. A joint test, adding the yearly dichotomy variables to the model yielded $F(7, 263) = 4.11, p=.000$. The high significance of the test value indicates that the yearly dichotomy variables should be included in the model. The results confirm anecdotal evidence that interim reports have established their position in corporate communication. The high statistical significance of the F -test value, 10.02, for the whole model indicates that overall the model provides

Table 2. Regression results of all interim reports including purely voluntary disclosures only

Dependent variable: DIVOLPUR				
Independent variables	Parameter estimate	Standard error	<i>t</i> value	
			standard	White ^a
D ₈₅	-.110	.061		
D ₈₆	-.058	.057		
D ₈₇	-.044	.058		
D ₈₈	-.007	.059		
D ₈₉	.018	.059		
D ₉₀	.006	.057		
D ₉₁	.000	.056		
D ₉₂	-.018	.058		
LHOLNU	.012	.005	2.321	2.363
FIRMS	-.001	.000	-2.165	-2.303
SCGNETS	.087	.047	1.869	1.803
SNIQKPOP	.003	.001	2.822	2.624
ANNBETA	-.014	.019	-.721	-.758
ANNDEBTS	.003	.003	.970	1.060
POSBCAR	-.002	.021	-.097	-.094
NIQKPOP	.001	.001	1.041	1.010
PROFNETP	-.390	.112	-3.478	-3.701
LANPERSO	.029	.006	4.968	4.774
Adjusted R ² =35.40%		F(17, 263)= 10.02 , p=.000		
White: χ ² (139)=141.02, p=.436		Jarque-Bera: χ ² (2)=1.92, p=.383		RESET: F(3, 277)=.35, p=.789

a = White refers to heteroscedasticity-corrected *t* values (White, 1980),
 DIVOLPUR = index of all interim reports containing purely voluntary disclosures only,
 D₈₅ to D₉₂ = yearly dichotomy variables,
 LHOLNU = natural logarithm of the number of shareholders,
 FIRMS = percentage of corporate ownership,

(for other table footnotes see next page)

Table 2 (continued)

SCGNETS	= standard deviation of percentage change in net sales,
SNIQKPOP	= standard deviation of net investments/total assets ratio,
ANNBETA	= market model beta,
ANNDEBTS	= debt/equity ratio,
POSBCAR	= post-event cumulative abnormal return (CAR) at business day 140. Expected returns are based on the market model.
NIQKPOP	= net investments/total assets ratio,
PROFNETP	= profit/net sales ratio, and
LANPERSO	= natural logarithm of the number of personnel.

Boldface (*italic boldface*) designates statistical significance at the 5% (**0.1%**) level.

evidence of a linear relationship between DIVOLPUR and the explanatory variables (see table 2).

The same set of tests as those used for the DIALL model were applied for the DIVOLPUR model. This allows the reader to see how well the OLS model corresponds to alternative data. The tests are detailed in table 2. The heteroscedasticity test (White, 1980) of the error terms indicates that the residual variance cannot be forecasted for the DIVOLPUR model. The error terms from the DIVOLPUR regression give $\chi^2(139)=141.02$, $p=.436$. The test value indicates that no heteroscedasticity is found. Another heteroscedasticity test was performed, following the procedure established with the DIALL regression (Breusch & Pagan, 1979). This tested whether the squared error terms and the moments of the predicted values were correlated. Contrary to the DIALL model results, no significant correlation existed with the DIVOLPUR model. This contrast gives further evidence that the data in the DIVOLPUR model are not heteroscedastic.

The normality of the residual terms was investigated by means of the Jarque-Bera test (Jarque & Bera, 1987). The test value for the DIVOLPUR regression error term yielded $\chi^2(2) = 1.92, p = .383$. This indicates no deviation from normality. Therefore the DIVOLPUR model should be acceptable for predictive use in chapter 8.

Finally, the RESET test for identifying nonlinearity (Ramsey, 1969) was performed. The model containing error terms from the DIVOLPUR regression yielded $F(3, 277) = .35, p = .789$. The test value indicates that the linear model should be used in preference to a nonlinear model.

Besides the impact of regulation, there are several other interesting conclusions that may be drawn from table 2 above. In general: (1) governance structure, (2) business risk, (3) growth potential, and (4) firm size have variables with significant coefficients in the DIVOLPUR model. The governance structure exercises two types of influence over voluntary disclosure. One, the variable *number of shareholders* has a positive and significant coefficient. In the DIVOLPUR model a greater number of shareholders also causes extended voluntary disclosure in interim reports. In the DIALL model the coefficient of *the number of shareholders* is not statistically significant. One reason for the different outcome might be that the DIVOLPUR index is more sensitive to firm-specific factors than the DIALL index. Managers have fewer choices to make when disclosing mandatory items. This could cause the sensitivity of DIALL to explanatory variables be lower than that of DIVOLPUR. Two, the coefficient of *the percentage of corporate ownership* variable is negative and statistically significant. The interpretation of this result is that where a large proportion of a firm's shares are owned by other firms, that firm will tend to disclose less than a firm with a broad base

of shareholders. Firms, as owners, can be classified as institutional investors. They are in a position to demand high quality information and communication from the firms whose shares they own. This leads to the conclusion that other communication channels are used in cases where other corporates own a significant portion of a firm. One of these other communication channels is a seat on the board. Bradbury (1992, p. 144) suggests that if a capital market is thin, indirect channels of corporate disclosure might become more widely used. This argument is also valid in the current study.

One of the business risk variables, SNIQKPOP, has a positive and significant coefficient. In the DIVOLPUR model a high standard deviation in net investments is related to extended disclosure. The reasons for extended disclosure are likely to be very similar to those already discussed with the DIALL results.

One of the growth potential variables, PROFNETP, has a negative and highly significant coefficient. The sign of the coefficient is contrary to that expected. This result suggests that a high *profit/net sales ratio* does not in itself result in any voluntary disclosure in interim reports. This view is similar to that previously discussed in connection with the DIALL results. One possible interpretation of this outcome is that a firm's managers view good profit generation as sufficiently strong communication to outside interest groups. No extension of the formal disclosure process to the capital markets and other interest groups appears to be viewed as warranted.

The firm size variable, LANPERSO, has a positive and significant coefficient. This is an identical outcome as with the DIALL model. The coefficients of the variables

approximating the firm's market risk (ANNBETA), capital structure (ANNDEBTS), mispricing of the firm (POSBCAR), and the firm's growth (NIQKPOP), are not statistically significant.

A comparison of the results of the DIALL and DIVOLPUR models (tables 1 and 2) indicates that, besides the year in which an interim report is published, the variables for: (1) business risk, (2) growth potential, and (3) firm size have significant coefficients in both of the models. In addition, the variables for governance structure have significant coefficients in the DIVOLPUR model but not in the DIALL model. The next chapter investigates more of the implications in the market resulting from different levels of disclosure in interim reports.

8. Implications of the information disclosed in interim reports

8.1. Construction of the hypothesis

In this chapter, the implications of the information disclosed in interim reports are studied. The stated hypothesis (HI, in its alternate form) in the implications part of the study is as follows:

HI₁: The degree of disclosure has an impact on the market.

The nature of the above hypothesis is fairly general. Some kind of relationship between disclosure, earnings, and stock returns is assumed to exist. However, at the derivation stage of the hypothesis there is only limited a priori knowledge about the exact relationships between the variables in question. The major background guiding the derivation of hypothesis HI₁ is summarized below.

Prior academic literature has reported the relationship between stock returns and earnings. However, although there is a wealth of evidence of this relationship, the degree of explanatory power of the applied models has been said to be still rather low (Lev, 1989). The evidence, therefore, supports the view that earnings are rather limited in their usefulness to investors. One approach, potentially leading to a greater understanding of the market's use of financial statements in business analysis and valuation, is to include disclosure variable(s) in returns/earnings models. The inclusion of disclosure variable(s), with a suitable research design, should add to the informativeness of returns/earnings models. This, in turn, should help describe the role

of financial statement data in the security pricing process (see also Palepu, Bernard, & Healy, 1996).

Further support for the hypothesis applied in the implications part of the study can be found in literature where corporate financial statements are considered a product of the market and political processes (for more details of this, see Watts, 1977). As reported in chapter 7 above, the matureness of the market is an important variable explaining disclosure in interim reports. Partly, therefore, the interim reporting data used in this study have the potential to contain information on the implications of disclosure in interim reports.

Disclosure has the potential to contain market-relevant information. However, in order to properly capture and measure the information value of disclosure to the market, disclosure should first be quantified. In this study special care has been taken in the construction and completion of disclosure scoresheets (described previously in chapter 7; see also Lev & Thiagarajan, 1993, for the guided search procedure for fundamentals). The validity of the disclosure measure, in turn, should facilitate the relevance of research into disclosure.

Finally, previous related research has found preliminary evidence that both earnings and disclosure provide market-relevant information (Kanto & Schadewitz, 1995). The present work adds to this preliminary finding by focusing on the purely voluntary portion of disclosure. Purely voluntary disclosure in interim reports ought to be less distorted by regulatory developments than is overall disclosure, which contains a mandatory set of elements.

8.2. *Methods for analyzing market effects of disclosed information*

The methods applied are fairly conventional in this research field. The contribution here is to analyze how disclosure is viewed by users. This impact is measured by changes in share prices. This study concentrates solely on disclosures in interim reports that are purely voluntary throughout the research period: 1985-93. It is likely that some of the voluntary part of any disclosure reflects the information that management desires to communicate to investors. The remainder of the voluntary disclosure potentially reflects management's reaction to mandatory disclosures or expectations of subsequent disclosure requirements. This section contains the principles for each method applied in order to capture the implications of interim reports for the stock markets. A more refined discussion of the methods is presented in each section.

Section 8.3 focuses on the association between: (1) returns, (2) earnings, and (3) disclosure. This is accomplished by means of multiple linear regressions. In the regressions, cumulative abnormal returns (CAR) serve as the dependent variable, with unexpected earnings and a measure of stock price variability as the independent variables. Defining abnormal returns as the difference between actual returns and normal returns (t is the time subscript), $AR_t = R_t^A - R_t^N$, CAR can be computed additively (Foster, 1986, pp. 404-405). In this study, the computation of abnormal returns is presented in eq. (3) later in the text.

Qualitative variables can provide explanatory power in regression analysis (Neter, Wasserman, & Kutner, 1990). Preliminary analysis indicate that unexpected disclosure could be applied as a classificatory variable for the regressions in this

study. As a result, regressions were performed separately for: (1) the lower unexpected disclosure quartile, $n=64$; (2) the two middle unexpected disclosure quartiles, $n=127$; and (3) the upper unexpected disclosure quartile, $n=63/64$. This classification is similar to that recently reported by Penno (1996), who derives theoretical conditions in which management applies a high precision (*back-to-the-wall*) disclosure policy in some situations and a low precision (*don't-rock-the-boat*) disclosure policy in other situations. This procedure is described in greater detail in section 8.5.1 below.

Schadewitz (1996) finds it beneficial, in terms of capturing and controlling potential asynchrony between prices and earnings, to compute coefficients of unexpected earnings for different window definitions. A similar research design is applied in Collins and Kothari (1989). The first type of window is contemporaneous with the interim financial statement period: (bgn, end), where *bgn/end* refers to the beginning/ending day of the interim reporting period. This is a logical interpretation of the association approach (see also Collins, Kothari, Shanken, & Sloan, 1994). Relevant events that will affect the valuation of shares are assumed to occur over the entire accounting period (Collins & Kothari, 1989). By initially applying a return window that is contemporaneous with the interim earnings period, benchmark values for the earnings response coefficients (ERCs) are derived. The second window type starts at the beginning of the interim reporting period but ends 30, or alternatively 15, business days before the reporting date (event). The third window type also starts at the beginning of the interim reporting period, but ends at the event, or alternatively 15 or 30 business days after the event. By extending the window to the event and past it,

it is possible to study the impact of the announced information (earnings and disclosures) on ERCs.

Section 8.4 focuses more closely on the implications caused by the event itself. This is done by applying short and intermediate windows, instead of long ones, around the event. In this part of the work, the long window periods are shortened and subdivided. The pre-event period examined begins 20 days before the announcement. The post-event period ends 20 days after the announcement. Each period is further divided in order to capture the associated relationships with more precision. In particular, at and immediately after the event, single day windows are employed to specifically identify the length of time it takes for the markets to react to unexpected earnings and related disclosures.

Unexpected disclosure is the classificatory variable. CARs are applied to capture information that may cause abnormal return behavior near to the event. That portion of the information which is new, previously unknown, to the market is the source of abnormal returns at the event. Previous research shows that interim earnings are informative to users of interim reports (Schadewitz, 1992). However, it is still somewhat obscure whether data besides earnings contains information valuable to the market. Kanto and Schadewitz (1995) give preliminary evidence that disclosure assists in the communication of earnings information to the market.

Kanto and Schadewitz (1995) employ actual earnings and disclosure instead of the unexpected form of the variables, as in the present research. Furthermore, the disclosure variable in the previous study is an index, including both mandatory and

voluntary disclosures (DIALL), instead of an index containing unexpected purely voluntary disclosures only (UPVD). The weekly CAR investigation period applied in the previous paper is further shortened in the short window part of this research. This is done in an effort to specifically identify the length of time it takes for the markets to react to earnings and related disclosures. These are just some of the ways in which part of this study relates to Kanto and Schadewitz (1995).

The following two sections describe the research design in more detail.

8.3. Association between share price, unexpected earnings, and unexpected disclosures with long return periods

The association between share price and a firm's potential value can be studied by regressing the information contained in interim reports with contemporaneous share price data. The values of the regression coefficients (ERCs) allow a scrutiny of the extent to which price has captured the firm-specific information that is known before the actual event. The event day is designated as time 0. The natural basis for window definition is to start the computations using return measurement windows that are symmetrical with the interim reporting period: (bgn, end).

Note that the end of the reporting period (end) need not be the same as the date of the announcement (0). Because this contemporaneous window does not extend beyond the announcement date, the impact of the event is excluded from this window type. This initial examination period is designed to capture the degree to which the actual operations of the firm during the reporting period are reflected in share prices. In

addition to this symmetrical window type, two asymmetrical window classes were applied.

The second window type starts at the beginning of the reporting period (bgn) and ends 30 or 15 business days before the announcement of interim reports: (bgn, -30) or (bgn, -15). This window type does not contain the information gained from the actual event. The window is designed to discover the general association between earnings and prices. If prices reflect valuation-relevant events with a lag, this window construction should capture at least some of potential lack of synchrony between prices and earnings.

The third window type includes the event. This window type starts at the beginning of the reporting period (bgn) and extends 0, 15, or 30 business days after the event: (bgn, 0), (bgn, 15), or (bgn, 30). By comparing the ERCs obtained from these three different models, it is possible to draw conclusions about when and to what extent earnings information and disclosure information are reflected in prices. Eq. (3) below summarizes the regressions and applied variables:

$$CAR(bgn, d)_{it} = \alpha_0 + \alpha_1 UE_{it} + \alpha_2 SDR_{it} + e_{it}, \quad (3)$$

where

$CAR(bgn, d)_{it}$ = cumulative abnormal returns in an arithmetic (additive) form, CAR for stock i at event t . Expected returns are based on the market model. Cumulation starts on the first business day of the interim reporting period bgn and ends on date d . A negative/positive sign for a day d indicates a pre/post-event day.

α_0 = intercept,

α_1 = regression coefficient of the unexpected earnings UE ,

α_2 = regression coefficient of the standard deviation of returns SDR during the (-30, 30) business day period around the event, and

e_{it} = n.i.d. errors for stock i at event t .

UE_{it} is defined as: [*interim earnings after financial items* (t') - *interim earnings after financial items (corresponding period, $t'-1$)*] / *market value of equity at the beginning of interim reporting period* (t'). In the notation i refers to the stock, t to the event, and t' to the year. In this context, it should be mentioned that some studies apply alternative earnings and returns specifications when studying the association between them (Collins, Kothari, Shanken, & Sloan, 1994; Schadewitz, 1992).

Seasonal random walk (SRW) earnings forecasts are preferred over an index model mainly because of the previous findings with a smaller interim report dataset (Schadewitz, 1992). In particular, the portfolio comprising firms with negative unexpected earnings, forecasted using the SRW model, was also the weakest performer when evaluated by the abnormal performance index (API). This outcome supports the view that unexpected earnings obtained via SRW capture fairly well the actual degree of surprise to the market caused by the event. This finding can be related

to the discussion on how investors operationally determine earnings. For example, investors are unlikely to use sophisticated statistical methods to determinate earnings persistence (Lev & Thiagarajan, 1993).

Furthermore, the management comments disclosed in interim reports provide support for the use of SRW models. It is a standard practice that managers, in their discussion of the current interim reporting period, compare performance to the corresponding period in the previous year. This kind of comparison is very natural, especially when the operations of a firm are sensitive to seasonal factors. Also, the SRW forecasting model properly takes potential seasonalities into account.

Finnish regulations also stipulate that the information contained in an interim report must enable comparison with the information for the corresponding period of the preceding year (HSE Cooperative, 1995, p. 19). This requirement should further result in earnings figures that lend themselves to SRW forecasting. This is especially important in cases where a firm has changed the length of reporting period covered in its interim reports from the preceding year. Section 4.2.3, above, provides a review of these regulations.

Finally, in the present study, annual earnings are not included in the interim earnings forecasts. A central reason for this practice is the relationship between interim and annual financial statements. In Finland, interim reports are consistent with the discrete reporting view. In this view, each interim period is considered independent (Foster, 1986, p. 223). Sales and expenses occurring during the interim period are reported as such. In the discrete approach, the emphasis is on the actual achievements of the

interim period (Fried & Livnat, 1981, p. 493). Also, the users of interim financial statements are assumed to monitor a firm's performance during the reported period (op. cit., p. 493). Because the periodical data are reported as independent of other periods they are liable to contain biases caused by such factors as seasonality. Foster (1977) presents empirical evidence of this.

In eq. (3) above, the intercept α_0 captures other possible factors influencing returns independent of earnings and disclosure. No theoretical value is derived for α_1 in eq. (3). Because the only parameter that varies in eq. (3) in different runs is the window, the coefficient α_1 permits analysis of the effects of: (1) window length and (2) the changes in the underlying information environment. Benchmark values for α_1 were obtained from regression with contemporaneous windows: CAR(bgn, end).

In association research, it is conventional to use unexpected earnings as an independent variable. Christie (1987) shows that the deflator should be based on the market value of an equity. In this study, unexpected earnings are deflated, but not unexpected disclosure. The reason for this is that disclosure measures are by their nature comparable as index numbers (see section 7.1.3 above).

Unexpected disclosure was applied as a classificatory variable (detailed in section 8.5.1 below). This was done because disclosure is qualitative by nature. Moreover, there is no reason to expect that its influence is linear. On the contrary, previous studies suggest that it is nonlinear (Kanto & Schadewitz, 1995). A disclosure classification was created by dividing unexpected disclosure into quartiles. After some experiments and tests it was found that the two middle quartiles did not essentially

differ from each other. Therefore, three classes of unexpected purely voluntary disclosures (UPVD) were used: (1) *Lower quartile*, first quartile; (2) *Middle quartiles*, second and third quartile; and (3) *Upper quartile*, fourth quartile.

The main interest is to establish whether unexpected earnings information impacts more or less strongly when reported together with various levels of unexpected disclosure. The reason for applying unexpected purely voluntary disclosure, instead of all disclosed items, is fairly clear. It is only logical that firm-specific items are better reflected in the index in which the firm itself has most jurisdiction (see section 7.1.1 above). When an unexpected event occurs in a firm, it should be best reflected in the organization's voluntary disclosure. Purely voluntary items were selected because, as chapter 7 indicates, mandatory developments could exercise some influence over voluntary reporting. It can be expected that this influence is least when purely voluntary items are employed. Of course, one reason for including disclosure into the study is to obtain further insight into the low returns-earnings relationship reported in prior research (see Lev, 1989).

The first three CAR windows were: (bgn, end), (bgn, -30), and (bgn, -15). The impact of unexpected disclosure was not known in any of these. Rather, they measure the impact of all communication other than that represented by the forthcoming income statement. A firm's disclosure behavior before the event can be studied by comparing regression coefficients between separate disclosure quartiles.

The equations where the window includes the interim report announcement indicate what reactions the interim reports themselves provoke in the markets. The cumulation periods are: (bgn, 0), (bgn, 15), and (bgn, 30).

8.4. Association between share price, unexpected earnings, and unexpected disclosures with short and intermediate return periods

This subsection focuses on the direct reactions to disclosure around the event. This short return window approach provides additional evidence about how the actual announcement is received by investors. This subsection should provide additional understanding to section 8.3, where long return windows were applied to determine the degree of association between returns and independent variables.

In order to control for the potential effects of share-related uncertainty, a proxy for price variability was applied. In this case, it was the standard deviation of returns during business days (-30, 30) around the event. A similar kind of variable is applied by Greenstein and Sami (1994).

By comparing the regressions with several different window definitions it is possible to deduce information about the association between returns, earnings, and price variability relative to the event (for the use of varying return cumulation periods in the vicinity of the event, see e.g. Ball & Kothari, 1991; Bernard & Thomas, 1989, 1990; Brown, Clinch, & Foster, 1992). Because unexpected disclosure was applied as a classificatory variable, it is possible to compare the effects of different levels of disclosure on the information content of earnings. The model is presented below:

$$CAR(d1, d2)_{it} = \beta_0 + \beta_1 UE_{it} + \beta_2 SDR_{it} + e_{it}, \quad (4)$$

where

- $CAR(d1, d2)_{it}$ = cumulative abnormal returns in an arithmetic (additive) form, CAR for stock i at event t . Expected returns are based on the market model. Cumulation starts on date $d1$ and ends on date $d2$. A negative/positive sign for the day indicates a pre/post-event day.
- β_0 = intercept,
- β_1 = regression coefficient of the unexpected earnings UE ,
- β_2 = regression coefficient of the standard deviation of returns SDR during the (-30, 30) business day period around the event, and
- e_{it} = n.i.d. errors for stock i at event t .

UE_{it} is defined as: [*interim earnings after financial items (t') - interim earnings after financial items (corresponding period, $t'-1$)*] / *market value of equity at the beginning of interim reporting period (t')*. In the notation i refers to the stock, t to the event, and t' to the year.

The bid-ask spread (SPREAD) around the event was studied using the model:

$$SPREAD(d)_{it} = \gamma_0 + \gamma_1 UE_{it} + \gamma_2 SDR_{it} + e_{it}, \quad (5)$$

where

- $SPREAD(d)_{it}$ = bid-ask spread at day d for stock i at event t [see eq. (6) below]. A negative/positive sign for d indicates a pre/post-event day.
- γ_0 = intercept,
- γ_1 = regression coefficient of the unexpected earnings UE ,
- γ_2 = regression coefficient of the standard deviation of returns SDR during the (-30, 30) business day period around the event, and
- e_{it} = n.i.d. errors for stock i at event t .

The SPREAD for eq. (5) above is computed as follows:

$$SPREAD(d)_{it} = 100 * [A(d)_{it} - B(d)_{it}] / [(A(d)_{it} + B(d)_{it}) / 2], \quad (6)$$

where

$SPREAD(d)_{it}$ = bid-ask spread at day d for stock i at event t . A negative/positive sign for d indicates a pre/post-event day.

$A(d)_{it}$ = closing ask price at day d for stock i at event t , and

$B(d)_{it}$ = closing bid price at day d for stock i at event t .

The following sections report the empirical results.

8.5. *Implications of disclosure*

8.5.1. *Share price responses to unexpected earnings and unexpected disclosures with long return windows*

This section reports the results of the association part of the study, with its long return periods. Section 8.5.2 discusses the results obtained with short and intermediate periods. Table 3 below summarizes the results based on regressions of unexpected earnings and variations in returns on CAR, using eq. (3), in different disclosure classes. In table 3, the separate columns contain the regression results for the lower, middle, and upper unexpected disclosure quartiles. The rows contain the respective cumulation period for abnormal returns. Also, results with heteroscedasticity-corrected t values (White, 1980) were computed. The results of those regressions are reported in appendix H-1 and are essentially the same as those in the main body of this text. The forecasts of expected disclosure were obtained from the combined model, consisting of: (1) the model reported in the determinants part of this study as

shown in table 2 in section 7.3.2 and (2) a random walk forecast of disclosure. The reason for including a random walk component in the forecasting model is the incremental significance of the random walk forecast in the estimation of expected disclosure compared to the forecast based solely on the determinants model. A random walk is applied because of its potential to resemble an actual comparison of two consecutive interim reports.

Both the determinants part and the random walk part of the combined model have equal weights. The original disclosure forecasting model gives approximately the same weight to the determinants part and the random walk part of the model. A combined model with equal weights is intuitively appealing. Therefore, a test was performed to see whether these parts of the combined model can be assigned exactly equal weights. The test was passed. Consequently, disclosure was forecasted using the combined model, with identical weights assigned to the determinants component and the random walk component.

For the combined model, the model reported in the determinants part was estimated separately for each interim report. The random walk forecast for current disclosure was the previous purely voluntary disclosure score for a particular firm's interim report.

The regressions were performed according to disclosure quartiles. The second and third disclosure quartiles were pooled. The combination of quarters two and three was based on the *F* tests performed separately for each of the windows presented in table 3. The *F* test for the pooling of quartiles two and three was clearly passed five times

Table 3. Regressions of unexpected earnings and variations in returns on CAR with long measurement windows

CAR(bgn, d)		Disclosure quartile: unexpected purely voluntary disclosure (UPVD)											
		Lower quartile ^b				Middle quartiles ^c				Upper quartile			
d	A ₀	UE	SDR	Adj. R ²	A ₀	UE	SDR	Adj. R ²	A ₀	UE	SDR	Adj. R ²	
end	.139	.060	-.125	30.2%	.080	.046	-.036	0.0%	.091	.040	.005b	2.3%	
-30	.150	.048	-.100	29.0	.126	.096	-.018	12.4	.110	.030	.014a	1.1	
-15	.138	.055	-.110	29.4	.122	.109	-.019	12.6	.101	.041	.010b	3.5	
0	.437	.693	.026	2.5	2.306	-.030	-.614	0.4	2.402	.257	-2.332a	8.0	
15	.140	.062	-.148	31.7	.120	.138	-.032	15.1	.081	.038	.000b	1.2	
30	.149	.064	-.167	31.2	.121	.134	-.043	13.1	-.081	.046	.074b	-1.9	

a: n = 63; b: n = 64; and c: n = 127.

CAR(bgn, d) = cumulative abnormal returns starting from the beginning day of the interim reporting period *bgn* and ending on day *d*. Expected returns are based on the market model. A negative/positive sign for a day indicates a pre/post-event day. *End* refers to the end day of the interim reporting period.

A₀ = intercept.

(for other table footnotes see next page)

Table 3 (continued)

UE = unexpected earnings where the forecast is based on a seasonal random walk model. UE is deflated by the market value of the equity at the beginning of interim reporting period.

SDR = standard deviation of returns during the 61 business days: (-30, 30).

The unexpected disclosure class boundaries are as follows: (1) lower quartile, $UPVD < -.04212$; (2) middle quartiles, $-.04212 \leq UPVD < .04460$; and (3) upper quartile, $.04460 \leq UPVD$. **Boldface (*italic boldface*)** designates statistical significance at the **5% (*0.1%*)** level. In the Adj. R^2 columns this notation indicates statistical significance of the F test.

out of six. The unexpected disclosure class boundaries were as follows: (1) lower quartile, $UPVD < -.04212$; (2) middle quartiles, $-.04212 \leq UPVD < .04460$; and (3) upper quartile, $.04460 \leq UPVD$.

The cross-tabulation between UPVD and UE, with $\chi^2(9)$, is 16.24. See appendix I for details of this. The probability of the value is 6.2%, indicating that there might be a slight interaction between UPVD and UE. This is due to the fairly large number of observations at the cross-tabulation of the first unexpected disclosure quartile and the second unexpected earnings quartile. Correspondingly, at the cross-tabulation of the fourth unexpected disclosure quartile and the second unexpected earnings quartile, the number of observations is fairly small. In the rest of the cells, the UE observations were fairly evenly distributed across the UPVD quartiles.

The results in table 3 indicate that the markets seem to expect a certain level of disclosure. Table 3 shows that unexpected earnings are most strongly associated with the CAR when the market's expectations are matched by the actual level of disclosure as they are in the middle quartiles. This outcome suggests that a firm's management can enhance its earnings information by preparing interim reports that contain the expected level of disclosure. Recently, Frost and Kinney (1996) have observed substantial variations in earnings/stock returns correlations in different domicile and disclosure groups.

When disclosure conforms with expected disclosure (middle quartiles), the coefficients of the SDR variables are insignificant in all of the six window definitions. The interpretation of this is that factors other than return-related uncertainty explain

the CAR when actual disclosure matches expectations. On a practical level, this result suggests that it is beneficial for a firm to disclose in a consistent manner over time and also to provide an adequate amount and quality of disclosure compared to other similar firms.

In contrast to the middle quartiles, both the UE and SDR variables in the lower quartile have statistically significant coefficients. The significant UE coefficients are positive, whilst those for SDR are negative. The regression results suggest that in an unexpected low disclosure situation both variables, UE and SDR, explain the behavior of CAR. In the middle quartiles the UE variable alone explains CAR. In the lower and middle disclosure quartiles, the intercept indicates statistical significance, at least below the 5% level, in all but one of the regressions. In this set of models, economic factors other than those identified in the models seem to exert a significant influence. One of these factors is the fact that the markets interpret the event itself as good news.

The three return windows ending before the event indicate that there is an association between returns and earnings prior to the event. These are: (bgn, end), (bgn, -30), and (bgn, -15). Besides the positive and significant coefficient of the UE variable, the coefficient of the SDR variable is also significant but negative before the event in the lower disclosure quartile. This result suggests that anticipation of the forthcoming interim report's content differs between the lower and middle quartiles - the share price uncertainty variable in the model, SDR, affects the behavior of CAR before the event solely in the lower quartile.

The results in the upper quartile are different to those obtained in the lower and middle quartiles. In the upper quartile, the model is significant only for the cumulation period (bgn, 0). The variable with a negative and significant coefficient in that model is SDR. The standard deviation of the returns is negatively related to the CAR (bgn, 0) in the upper quartile. The knowledge that an event is forthcoming seems in itself be construed as good news in the upper quartile, too. This is indicated by the intercept, which is positive and significant for the periods (bgn, -30) and (bgn, -15). In this context, it should be mentioned that although the tests are performed separately for each cumulation period, they are to some degree interdependent. This is due to the method of computation of CAR: the starting day of each cumulation is always the beginning day of the interim reporting period (bgn). This dependency is not a major problem in this research, however, because the focus in this part of the study is on the measurement of the general association. By fixing the starting day as the bgn, it is possible to compare the regression results in the knowledge that the only change affecting the results is the end day of the cumulation (d).

In the next section, the results for the short and intermediate return periods are interpreted.

8.5.2. Share price responses to unexpected earnings and unexpected disclosures with short and intermediate return windows

In this part of the study the main interest is in the direct implications of the event for the share price. In order to capture these effects, both short and intermediate return cumulation periods around the event were applied using eq. (4) above. Section 8.5.2.1 presents the results for short window cumulations beginning before, at, and after the

event. Section 8.5.2.2 contains the results for intermediate windows - enveloping, pre- and post-event. The unexpected disclosure quartiles employed were the same as those in section 8.5.1.

8.5.2.1. Short windows beginning before, at, and after the event

Table 4 below contains the major results for the short and intermediate windows. There are 17 investigation periods reported in the table. The results with intermediate return windows are in panel A and with short return windows are in panel B. Also, heteroscedasticity-corrected t values (White, 1980) were computed and the results are reported in appendix H-2. These results are essentially the same as those in table 4.

First the results for periods beginning at the event are presented. These are: (0, 0) through (0, 5) and (0, 15). This sequence is long enough to show the effect of market assimilation of new information. $CAR(0, 15)$ is included in order to show the time by which the main impact of the event has been discounted in prices. In the middle quartiles, in contrast to the lower and upper quartiles, the model is significant as early as the event day. The positive coefficient of the UE variable is statistically significant at the 5% level. This outcome strongly supports the view that the markets can quickly revise their pre-event expectations of earnings information when other disclosed information besides earnings matches expectations. In order to confirm the conclusion based on the event day result, a regression was run for the preceding day (-1) alone. The outcome was that no statistically significant results, either for the model or for the individual coefficients, were found in any of the disclosure quartiles. This demonstrates that one day before the event the markets have not fully anticipated the

Table 4. Regressions of unexpected earnings and variations in returns on CAR with short and intermediate measurement windows

Disclosure quartile: unexpected purely voluntary disclosure (UPVD)												
CAR	Lower quartile ^b				Middle quartiles ^c				Upper quartile			
	B ₀	UE	SDR	Adj. R ²	B ₀	UE	SDR	Adj. R ²	B ₀	UE	SDR	Adj. R ²
(-20, 20)	2.710	1.733	-.656	3.0%	4.540	1.273	-.280	0.2%	3.053	-.656	-1.063a	-2.6%
(-20, -1)	1.090	1.041	-.635	6.1	2.771	-.720	-.763	1.5	2.922	.358	-1.906a	2.2
(0, 20)	1.620	.692	-.022	-1.2	1.770	1.993	.483	4.9	.131	-1.014	.844a	3.3
<i>Panel A: Intermediate periods - Enveloping, pre- and post-event</i>												
(-20,-16)	.807	.430	-1.485	7.3%	.622	-.663	-.295	3.0%	.636	-.054	.089a	-3.2%
(-15,-11)	.483	.772	1.413	7.6	.351	.130	.330	-0.4	.883	-.139	-.613a	-0.3
(-10, -6)	-.315	-.360	.181	2.3	.792	-.060	-.640	3.6	1.001	.183	-.837a	3.4
(-5, -1)	.115	.200	-.744	3.9	1.006	-.127	-.159	-1.2	.402	.368	-.545a	4.3
(0, 0)	-.461	.341	.123	3.7	-.155	.608	.127	5.1	.361	-.140	-.383a	-1.3
(0, 1)	.107	.481	-.662	15.6	.611	1.648	-.478	17.9	.617	.233	-1.070a	6.8
(0, 2)	-.565	.130	-.488	-1.6	.834	1.909	-.327	17.2	.592	.372	-.740a	6.2
(0, 3)	-.366	.103	-.182	-2.8	1.296	1.478	-.758	12.6	.672	1.461	-1.570a	37.9
(0, 4)	-.305	-.051	-1.007	-1.2	1.253	1.673	-.563	13.1	.691	1.145	-1.024a	20.1
(0, 5)	-.159	.124	-.419	-2.2	.944	1.067	-.423	4.3	.175	.897	-.717a	12.5
(0, 15)	.644	.584	.525	-1.7	1.386	.932	-.239	0.7	.197	-1.174	.370a	3.8
(6, 10)	.605	.037	.260	-2.9	-.102	-.439	.228	0.2	.438	-.928	-.330b	3.1
(11, 15)	.199	.423	.684	0.8	.544	.303	-.044	-0.8	-.437	-1.145	1.422b	23.3
(16, 20)	.976	.108	-.547	-1.1	.383	1.061	.722	5.2	-.208	.143	.508b	-2.1

Panel B: Short periods - Beginning before, at, and after the event

(for table footnotes see next page)

Table 4 (continued)

a: $n = 63$; b: $n = 64$; and c: $n = 127$.
 CAR($d1, d2$) = cumulative abnormal returns, starting from day $d1$ and ending on day $d2$. Expected returns are based on the market model. A negative/positive sign for a day indicates pre/post-event day.
 B_0 = intercept,
 UE = unexpected earnings (forecast based on seasonal random walk model), and
 SDR = standard deviation of returns during the 61 business days: (-30, 30).
 The unexpected disclosure class boundaries are as follows: (1) lower quartile, $UPVD < -.04212$; (2) middle quartiles, $-.04212 \leq UPVD < .04460$; and (3) upper quartile, $.04460 \leq UPVD$. **Boldface (italic boldface)** designates statistical significance at the **5% (0.1%)** level. In the Adj. R^2 columns this notation indicates statistical significance of the F test.

information content of the interim report. This outcome also gives additional evidence that the event days used in this study are defined precisely.

In this context, it is important to consider cases where shares do not trade on the event day. In general, the number of incidences of nontrading shares at the event was approximately the same as that on the pre- and post-event days around the event. Only a minor increase in the number of traded shares can be identified at and after the event. About one fifth of the shares were not traded at or around the event. In order to keep results as closely based on factual data as possible, no assumptions were made to substitute the nontrading cases. Booth, Kallunki, and Martikainen (1996) and Maynes and Rumsey (1993) measure unexpected returns around events when securities do not trade daily.

Another conclusion based on the middle quartile results is that new information from the event will gradually be discounted in prices after the event. For periods (0, 1) through (0, 4) the statistical significance of the whole model and the UE coefficient is below 0.1% level. The decreasing impact of the event in the course of the days following the event is evident in the values of the regression coefficients. In the middle quartiles, the highest value is obtained for the regression coefficient of UE when CAR is (0, 2). After that day, the UE coefficients start to decrease. This indicates that the effect of UE on abnormal returns is negative as early as day three. An exception is the cumulation period (0, 4), when there is a temporal increase in the UE coefficient. Unfortunately no normative explanation was found for this anomaly.

In the upper quartile, the model is also statistically significant in the majority of cases for short periods at and after the event. In addition, several relevant observations can be made when comparing the results of the middle and upper quartiles for the periods (0, 0) through (0, 5). First, in the upper quartile the model is significant for the period (0, 1). This is one day later than in the middle quartiles. These results indicate that the markets take longer to react to unexpected high disclosure (upper quartile) than to react to expected level of disclosure (middle quartiles). A discussion of the possible reasons for this is presented in the following. Second, in the upper quartile, the coefficients of the UE and SDR variables are not significant before the period (0, 3). The model can explain the behavior of $CAR(0, 3)$ fairly well, because the adjusted R^2 is a highly significant 37.9%.

In the cumulation periods (0, 4) and (0, 5), only the coefficient for the UE variable is significant in the upper quartile. A comparison of the results of the middle and upper quartiles reveals that the new event-based information is discounted in prices with a delay and in the upper quartile within fewer days vis-à-vis the middle quartiles. This result shows that the new information of the event has a more decisive impact on the market when the disclosed material is as expected (middle quartiles) than it is when the markets are surprised by the level of disclosure, as they are in either the lower or the upper quartiles. Therefore it can be concluded that when the level of disclosure is as expected the communication of earnings to the market is assisted. The findings obtained with the short periods underline the importance for firms of following a consistent and predictable disclosure practice in order to avoid causing the markets any surprises in their communication. When disclosure is below expectations (lower quartile), even the earnings information has a low impact on the CAR.

The markets can also be surprised by disclosure that exceeds expectations (upper quartile). In such cases the markets seem to react with a delay to the new information announced in the event. There can be at least two possible, complementary explanations for the delayed market response in the upper quartile. First, it might demand additional time and effort from market participants to analyze and make investment decisions based on an unexpectedly high degree of disclosure compared to a situation where disclosure is as expected (middle quartiles). Second, it is also possible that some specific reasons have induced the extended disclosure. In particular, if a firm's management considers earnings information to be insufficient to present a true and complete view of the firm's affairs, it may try to mitigate this information problem by extending disclosure to be more thorough and detailed. It could be that earnings figures are not an equally suitable indicator of a firm's performance in different disclosure quartiles. These potential variations in the ability of earnings to measure performance may also influence a firm's managers' disclosure behavior. One example supporting this view is the fairly frequent statements in interim reports that earnings figures are affected by seasonal variations.

The last three rows in panel B indicate the market response to short windows beginning after the event. The (6, 10) row clearly shows that the majority of the new information revealed in the interim reports has been completely discounted in prices during the previous six days. The (6, 10) row includes no statistically significant coefficients and the model is also insignificant.

The following row, (11, 15), shows a very similar pattern to the (6, 10) row. However, a difference between periods (6, 10) and (11, 15) can be perceived in the upper

quartile. The model and all its coefficients, apart from the intercept, are statistically significant in the (11, 15) period. This outcome can be partly explained as an overreaction to the information revealed in the event (De Bondt & Thaler, 1985). The signs of the coefficients are opposite to those in the statistically significant regressions in the upper quartile immediately after the event, thus supporting the view.

The bottom row in panel B, (16, 20), further confirms that the event-related information has already been discounted in prices. The model and all its parameters are statistically insignificant in the lower and upper disclosure quartiles. However, in the middle quartiles the coefficient of the UE variable and the model are significant at the 5% level. A possible explanation for the results for the middle quartiles is that the cumulation period (16, 20) reflects the association between returns and earnings, as discussed in section 8.2, above (Collins & Kothari, 1989).

An association is likely to be recognized in the middle quartiles, because firms in that disclosure group do not give the market any major surprises. A level of disclosure matching the market's expectations is probably partly a consequence of the fairly stable business conditions in which many of the firms in the middle group operate. A similar pattern of association is found in the middle, but not in the lower and upper quartiles, of the intermediate period (0, 20) in panel A. These short window results in the middle quartiles prepare the observer for a similar set of results in the intermediate windows, which are reported in the next subsection: 8.5.2.2.

The following is offered as an explanation for the middle quartiles. There appears to be an association between returns and earnings, most clearly reflected in table 4 in the

(0, 0) through (0, 5) and (16, 20) windows. After the information release to the market, in the middle quartiles, the markets return to their normal behavior some days after the event. The former may be characterized as a *reaction period*, which is followed by a *neutral period*. The whole market then reverts to an *association period* until another event begins the process again.

Finally, it should be mentioned that a set of analyses was systematically performed in order to establish how applicable the use of OLS is and how valid the results are in this context. The tests [White test (White, 1980), Jarque-Bera test (Jarque & Bera, 1987), and RESET test (Ramsey, 1969)] were run for the period (0, 5). That particular period is one of the most critical in the interpretation of the results. As in chapter 7, diagnostic tests with insignificant results are deliberately not reported here.

The White test indicated that the results are not affected by heteroscedasticity. However, another version of the Breusch-Pagan test (Breusch & Pagan, 1979) suggested the existence of some type of heteroscedasticity in the upper quartile. After an adjustment for heteroscedasticity, the model was rerun. Both the fit and the statistical significance of the original and the adjusted model were essentially the same. This indicates that although the heteroscedasticity is statistically significant, it does not appear to be a serious problem.

The normality of the residuals was examined by means of the Jarque-Bera test. In the upper quartile the residuals were clearly normally distributed. The test values obtained for the other quartiles were: (1) lower quartile, $\chi^2(2)=108.37, p=.000$; and (2) middle quartiles, $\chi^2(2)=92.44, p=.000$. The test values for the lower and middle quartiles

show that the normality assumptions in respect of residuals are seriously violated in those disclosure groups. Further analysis of the data is presented later in the text.

The potential nonlinear relationship between the dependent and the independent variables was studied using the RESET test. The low F value indicated that the present linear model is valid for the lower and middle quartiles. However, there was a potential slight nonlinearity between the dependent and the independent variables in the upper quartile, with its higher F value: $F(3, 59)=2.66, p=.056$. However, due to the relatively low level of significance of the F value, the potential nonlinearity should not have any material influence on the results.

In order to study the effect of potential outliers, a screening of the data was performed. The observations with the highest and lowest error residuals in the extreme disclosure quartiles and the two highest and two lowest error residuals in the pooled middle disclosure quartiles were eliminated.

The values in the White test with the screened data indicate that there is no heteroscedasticity in any of the disclosure quartiles. Conversely, another version of the Breusch-Pagan test (Breusch & Pagan, 1979) recognizes some sort of heteroscedasticity in the upper quartile (see text above for more details).

As regards the normality of the error residuals, the Jarque-Bera test was clearly passed in the middle and upper quartiles with the screened data. The results indicate that the deviation from normality in the middle quartiles with untrimmed data is due to a small number of outliers. But in the lower quartile the test value of $\chi^2(2)=8.03, p=.018$

suggests the existence of nonnormality even with the trimmed data. Further investigations show that in the lower quartile screening eliminates high kurtosis, but skewness remains. The essential results, however, are substantially the same and therefore the original results, without trimmed data, are reported.

Finally, the RESET test for nonlinearity was clearly passed in the lower and middle quartiles, also with the screened data. However, the test value for the upper disclosure quartile was $F(3, 57)=2.56, p=.064$. This suggests the existence of slight nonlinearity between the dependent and independent variables. Due to the insignificant F value, the potential nonlinearity is not considered to have any material influence on the results.

Together with the nonnormal outliers, influential observations were also examined. Some of the possible outliers were also identified as influential observations. However, no influential observations were found in the main body of the data. It should be also stated that two extreme values of the SDR variable were classified as outliers: (1) Corum (1988) and (2) Bakers' Wholesale, Inc. (1990). The criterion for excluding these two SDR values was that the values deviate by factors of ten from the other SDR values. A third outlier was the UE value for Stromsdal (1992). This value was extremely large, due to the very small deflator in its UE computation. All these three observations were interpreted as outliers, by the classical definition. They were, therefore, excluded in the final runs.

8.5.2.2. *Intermediate windows for enveloping, pre- and post-event periods*

Panel A in table 4 above reports the results for the intermediate windows: (-20, 20), (-20, -1), and (0, 20). The maximum length of the intermediate window was 41 business days, because this span captures all the relevant results for this part of the study. For example, the statistical significance of the overall model, as well as the individual coefficients, is about the same for CAR(-20, 20) as it is for the longer CAR(-30, 30) observations. In order to find out what effect the event has on the CAR, both pre-event and post-event cumulations, in addition to the enveloping period, were performed: (-20, -1) and (0, 20).

The results for the window (-20, 20) indicate that by focusing only on the 41 business day period, the model's ability to explain CAR is low. However, the model with the post-event period, (0, 20), shows statistical significance in the middle disclosure quartiles. More specifically, the model, the intercept, and coefficient of the UE variable are statistically significant at the 5% level. The significance of the UE coefficient suggests that the event causes a higher association between unexpected earnings and CAR when the reported disclosure conforms with expectations (middle quartiles) than in the lower and upper quartiles. The significance of the intercept in the middle quartiles, but not in the extreme quartiles, for the period (-20, -1) indicates that the event itself is considered by the markets to be good news. The result is in line with the view of the financial analyst interviewed (see section 7.1.3.1). The analyst stressed in the interview, which was conducted during the construction phase of the disclosure scoresheet, the essential importance of being aware of the precise event day in order to prepare accordingly.

8.5.3. Bid-ask spread, unexpected earnings, and unexpected disclosures with short return windows

This section discusses some findings for the bid-ask spread [see eq. (5) above]. Overall the results obtained for the bid-ask spread are weak. No statistically significant coefficients for the model in eq. (5) were obtained. The runs were performed separately for the disclosure quartiles presented in section 8.5.1.

One potential reason for the statistically insignificant results with the spread model might be differences in the trading patterns of HSE-listed firms. For this reason, the spread model in eq. (5) was performed also separately for firms listed solely on the HSE and for firms listed both on the HSE and one or more other exchanges. However, these additional runs did not provide any systematic or normative evidence that unexpected disclosure affects the bid-ask spread. Prior research in Finland has also reported weak results for spread. The bid-ask spread is one of the liquidity measures that Hedvall (1994) uses to study potential differences in liquidity before and after the introduction of the HETI automated trading system on the HSE. Hedvall provides more detail of the operation of HETI (op. cit., pp. 4-5). One reason for the low statistical significance obtained with the spread variable is probably the relatively low trading volume on the HSE. More generally, the thinness of a capital market very likely explain some of the difference in results compared to those obtained in the U.S. institutional environment (Bradbury, 1992, p. 144).

8.5.4. The main implications of disclosure in brief

Finally, some of the main findings related to the implications of the information in interim reports are summarized briefly. The results with the long return windows,

reported in table 3 above, imply that when disclosure is as expected (middle quartiles) there is a positive association between cumulative abnormal returns and unexpected earnings (statistical significance at the 0.1% level). The coefficient of the standard deviation of returns is statistically insignificant in the middle quartiles. In the lower quartile, the coefficients of UE and SDR are both statistically significant at the 5% level in most cases.

The short and intermediate periods reported in table 4 above give additional evidence of the way in which interim reports are used by the market. The short periods (panel B) beginning at the event, (0, 0) through (0, 5), show the principal finding - the degree of unexpected disclosure affects the communication of the earnings information content to the market. When the disclosures do not contain any surprises for the market, the coefficient of the UE variable is clearly both more frequently and more highly statistically significant than it is in the lower or upper disclosure quartiles. Furthermore, the model is more frequently statistically significant in the middle quartiles than it is in the lower or upper disclosure quartiles.

Part three

Conclusions

9. Summary and discussion

9.1. Summary of the study

This study examines both the qualitative and quantitative information contained in interim reports. Interim financial reporting only became mandatory in Finland in the calendar year 1986 (HSE Cooperative, 1988, p. 18). This unusual situation makes the Helsinki Stock Exchange (HSE) especially suited to the investigation of the determinants and implications of interim reporting in present-day conditions, as suggested by Burton (1981, p. 83).

The data for the database constructed in this study were extracted from interim reports published by the firms listed on the HSE in the calendar years 1985 through 1993. The finance and insurance sectors were excluded, due to their widely varying formats, both intra- and inter-company. Two types of interim report-specific disclosure indices were designed and applied. Special care was taken in the construction of the indices in order to make them as impartial as possible. Furthermore, the measures of disclosure were established from the original interim reports in an effort to minimize the influence of any perceptive bias. In the theoretical part of the study, it was hypothesized that the level of disclosure is a function of a firm's: (1) governance structure, (2) business risk, (3) market risk, (4) capital structure, (5) stock valuation, (6) growth, (7) growth potential, (8) size, and (9) market maturity. The variables were defined, as far as possible, to be consistent with prior research. There were some new variables and some changes in definition were made necessary in order to add to current understanding. The variables of the determinants of disclosure were mainly

expected to reflect the information asymmetry between managers and a firm's outside interest groups (Healy & Palepu, 1993).

The consequences of disclosure for the stock markets were studied in the implications part of the work. The focus was on unexpected purely voluntary disclosure, in order to capture that portion of disclosure over which a firm's management can exercise a lot of discretion. The consequences were examined by applying both long and short research periods in the vicinity of the event. The effects of interim reports on the market were measured by abnormal returns and bid-ask spreads.

9.1.1. Determinants of the information in interim reports

The overall disclosure in interim reports includes both the mandatory portion and items that are reported voluntarily. The results show that overall disclosure is directly related to the quantitative measures of: (1) business risk, (2) growth potential, and (3) firm size. Moreover, during the nine-year research period, 1985 through 1993, the development of the quality of interim reports was rapid, paralleling the expansion of accounting and market regulation. This explains the test results for the dichotomy market maturity variable.

An interesting finding is that a firm's growth potential seems to decrease the overall level of disclosure in interim reports. One possible explanation for this is that growth potential is in itself an indicator of a firm's performance. In certain business sectors, firm-specific information may be so valuable that firms are not willing to disclose it in their interim reports. It should also be mentioned that (1) governance structure, (2)

market risk, (3) capital structure, (4) stock valuation, and (5) firm growth do not help explain the overall level of disclosure.

Recent literature indicates the importance of voluntary disclosure (Healy & Palepu, 1995, pp. 138-139). Therefore voluntary disclosure was studied in addition to overall disclosure. The development of interim reporting legislation during the research period was considerable. This made it possible to examine the impact of increased regulation on the voluntary elements reported in interim reports. Another reason for investigating the voluntary portion of disclosure is its potential to reflect relevant firm- or industry-specific information that may not be contained in the regulated parts of the disclosure. In order to approximate the voluntary disclosure as closely as possible, items that were entirely voluntary during the research period were investigated. This led to the construction of a disclosure index for purely voluntary items.

Most of the determinants of purely voluntary disclosure in interim reports were the same as those for the overall disclosure. Just as the year is a statistically significant determinant of overall disclosure, it is also an important explanatory variable for the degree of purely voluntary disclosure. This indicates that firms are willing to submit voluntary information, besides mandatory items, in their interim reports.

The number of shareholders is one of the measures of the governance structure. It is a significant determinant of the voluntary, but not of the overall, disclosure model. This confirms that voluntary reporting is required to fulfill the various information needs of shareholders. Moreover, the size of corporate shareholdings seems to be negatively related to voluntary disclosure. This result suggests that especially in cases

where other corporates hold a large number of a firm's shares, alternative communication means are used to augment interim reports. The thinness of a capital market might encourage firms increasingly to use indirect channels of corporate communication, as stated in Bradbury (1992).

9.1.2. Implications of the information in interim reports

The principal finding in the implications part of the study is that the degree of disclosure assists in the communication of earnings information to the market. In the middle quartiles, after the market has digested the transmission of the interim report information, it returns to its normal behavior pattern some days after the event. This may be characterized as a *reaction period*. This is followed by a *neutral period*. The whole market then reverts to an *association period* until another event begins the process again.

In addition, the bid-ask spread is not statistically significantly related to the disclosure in the vicinity of the event. One possible reason for this is the thinness of trading in the HSE. In general, both the determinants part and the implications part support the stated hypotheses. Furthermore, the major results are in line with those of prior studies.

9.1.3. Organization of the research report

The present work follows the classical structure of a research report. It is divided into four main parts: (1) Preliminaries, chapter 1; (2) Theory and institutional setting, chapters 2 through 5; (3) Empirical evidence, chapters 6 through 8; and (4)

Conclusions, chapter 9. Supplementary material is provided in appendices A through J.

The first section of the study, *Preliminaries*, sets the stage for the research. It contains chapter 1 only. Special emphasis is placed on the reasons for studying a firm's business communication behavior, applying interim reports as the data source.

Part one, Theory and institutional setting, lays the theoretical foundation and describes the institutional regime of the study. Chapter 2 discusses current issues in the communication of corporate affairs to the capital markets. Chapter 3 contains a review of prior research. Firstly this review summarizes current knowledge related to interim reports. The second portion of the survey covers major developments in disclosure index studies over the past 30 years. The review begins with the pioneering work by Cerf (1961) and ends with the latest available disclosure studies.

Chapter 4 is devoted to the institutional setting. The rationale for including this chapter is to help the reader compare somewhat divergent institutional settings. The chapter begins with an international overview of interim reporting practices. Then the development of interim reporting regulation and legislation in Finland, the U.S.A., and Sweden is presented. The reason for including the U.S.A. is that the majority of academic literature available to the author is based on U.S. data. This makes a brief outline of the institutional setting in the United States a useful benchmark for subsequent analyses and contrasts. The interested reader can compare institutional settings and evaluate how the results may be influenced by these differences. Sweden is included because, besides its geographical proximity to Finland: (1) the economies

of the two countries are closely related, (2) there is a tradition of collaboration between Finland and Sweden in the area of regulation and legislation, and (3) relevant prior research is available (Martikainen, Yli-Olli, & Gunasekaran, 1991).

Chapter 5 derives the research hypotheses. The last part of the chapter outlines the structure of the empirical investigation.

Part two, Empirical evidence, details the data collection and preparation phases and the subsequent statistical analyses. Chapter 6 describes the collection of the accounting data and the stock market data in sections 6.1 and 6.2 respectively.

Chapter 7 familiarizes the reader with the determinants part of the study. Special care is taken to detail the development of the disclosure index applied in sections 7.1.1 and beyond.

Chapter 8 contains the implications part of the study. The construction of the hypothesis is described in section 8.1. The methods applied in this part of the work are presented in section 8.2. Section 8.5 reports the implications results when both long and short return measurement periods (windows) are used.

Part three, Conclusions, summarizes the work and offers suggestions for further research. This is accomplished in chapter 9.

9.2. Conclusions from the determinants perspective

Some prior studies of the determinants of disclosure have been criticized for their questionable use of the theory of agency and monitoring (Ball & Foster, 1982; Schipper, 1981). Models of agency and monitoring are relatively abstract. On the other hand, the richness of detail present in actual disclosure makes it necessary to explain disclosure behavior in a way that takes the institutional structure into account more comprehensively than agency and monitoring theory can.

In this study, the hypotheses are derived to gain insight into the actual determinants of disclosures in interim reports. Accordingly, in chapter 5, disclosure is defined as a function of the firm's: (1) governance structure, (2) business risk, (3) market risk, (4) capital structure, (5) stock valuation, (6) growth, (7) growth potential, (8) size, and (9) market maturity. The filter used in the selection of independent variables is their potential ability to provide indications of the need for disclosure. Prior literature is reviewed extensively to identify these variables.

In the following the results obtained in the determinants part of the study are presented briefly. The text is organized according to the variables comprising the theoretical disclosure function presented above.

The results for governance structure show that the greater the proportion of shares owned by other corporates, the lower the level of voluntary disclosure in interim reports. This indicates that means of communication other than interim reports are employed when other firms constitute significant shareholders. In such situations, the firm in question may also have a seat on the board, through which information can be

garnered. This is especially true when such ownership is combined with active participation in the firm's management. Information based solely on interim reports may be out of date or not specific enough for management purposes.

The positive and statistically significant coefficient of the governance structure variable indicates that the greater the number of shareholders, the higher the level of voluntary disclosure in interim reports. This finding confirms the existence of a positive relationship between disclosure and the number of shareholders, as reported by Cerf (1961).

Pribejriyat (1992) suggests that the greater the number of shareholders, the greater the heterogeneity in their information needs. He finds that the higher the concentration of shares, the lower the level of disclosure. In the present study, within the institutional owners group, ownership by firms is the variable that is most negatively correlated with the number of shareholders. This confirms that a low number of owners is correlated with ownership by firms. This relationship is also in line with the stated hypothesis that firms where owners exert strong control will disclose less than firms with strong management control.

Both the number of shareholders and the percentage of ownership by firms are significant in the purely voluntary disclosure regression. This suggests that ownership by firms and the number of shareholders reflect separate aspects of governance.

The results for the business risk variables show that business risk increases disclosure in both the general and in the purely voluntary elements of interim reports. The results

suggest that the higher the standard deviation of the percentage change in net sales or in the net investments/total assets ratio, the higher the level of disclosure. This is as hypothesized, but is in contrast to the findings of Garsombke (1979), who reports that variations in annual earnings are not related to disclosure.

In terms of market risk, the hypothesis is that the higher the risk, the higher is also the level of disclosure. Measures of market risk do not have statistically significant coefficients in the present study. This outcome strongly supports the view that market risk, as measured by market model *beta*, is not related to the level of disclosure in interim reports. This finding bears out results reported by others (Firth, 1984; Garsombke, 1979; Priebjrvat, 1992).

Prior research into capital structure indicates that, in general, a firm's need for capital is correlated to increased disclosure (Lang & Lundholm, 1993; Priebjrvat, 1992; Spero, 1979). Imhoff (1992) finds that high accounting quality, as judged by professional analysts, is related to low debt-to-equity ratios. In this study, on the other hand, the capital structure variables are not related to disclosure, as hypothesized. This outcome suggests that in Finland more direct communication links, such as debt contracts, connect the firm to its lenders. On the equity side, it could be that, when a firm issues shares, it is the public offering prospectus that is the vehicle by which the firm communicates its application of capital, rather than the interim report.

Two additional reasons why the results obtained in this study contradict those of some prior studies may be that others have applied: (1) annual reports or (2) overall disclosure quality instead of: (1) interim reports and (2) strictly voluntary disclosure.

The next disclosure determinant is hypothesized to be stock valuation. The supposition is that if securities are mispriced, managers will seek to inform the markets of the mispricing. However, no statistically significant results are obtained for the variables approximating possible mispricing. The coefficients of the stock valuation variables may be insignificant because of the relatively long windows. The 125 business day window could be too wide to capture the relationship between share prices and disclosure. The low relationship between share valuation and disclosure might also be due to potential differences in the assessment of information between accountants, financial analysts, and other users of disclosed information (Benjamin & Stanga, 1977; Chandra, 1974; Firth, 1979a; Havunen & Yli-Olli, 1986; Lee & Tweedie, 1975a, 1975b, 1976; Wallace, 1988).

Although this study does not find any evidence for a direct relationship between share valuation and disclosure, some studies report evidence of a connection between share price volatility and disclosure. Singhvi and Desai (1971) find that firms that disclose inadequate information tend to be repaid in the form of increased volatility in their stock prices. Conversely, Priebjivat (1992) finds no relationship between the level of disclosure and return variance. He supposes this to be related to the emerging nature of the particular host market studied: the Securities Exchange of Thailand.

Some prior studies report a positive relationship between disclosure and profitability (Cerf, 1961; Healy, Palepu, & Sweeney, 1995; Lang & Lundholm, 1993; Singhvi & Desai, 1971; Williams, 1992). Accordingly, disclosure is hypothesized in this study to be positively related to a firm's: (1) growth and (2) growth potential. Contrary to the hypothesis of the present study, growth potential, as measured by *the profit/net*

sales ratio, has a negative coefficient both in the overall and the purely voluntary models of disclosure behavior. The unexpected results obtained in this study can be explained by the emphasis placed on the analysis portion of interim reports. It seems that, especially in times when a firm is facing difficulties in its operations, extended analysis is introduced into the disclosures. This explanation is line with the finding of the present study that high growth potential is related to low disclosure. Another argument might be that managers believe a high *profit/net sales ratio* is adequate evidence of the firm's performance.

The eighth property hypothesized to be positively related to disclosure is firm size. In accordance with the findings of prior research, shown in appendix A, this study finds that the size variable has a positive and statistically highly significant coefficient in both the overall and purely voluntary disclosure models.

Developments in regulation took place during the research period, 1985-93. Furthermore, the growth of the HSE has been rapid, especially in the second half of the 1980s. Thus, yearly dichotomy variables were included in the model in order to capture developments designated as market maturity. The results obtained show that the year is an important factor in the explanation of disclosure. This finding is consistent with several prior studies shown in appendix A. Some evidence from Finland is presented by Tuominen (1991), and further evidence is provided in this research.

9.3. Conclusions from the implications perspective

The implications part of this research investigates the effect that unexpected purely voluntary disclosure in interim reports has on the market. The use of unexpected disclosure eliminates distortions caused by the influence of the determinants of disclosure. In order to extend the findings of prior research, particularly in returns-earnings studies, the influence of disclosure in the context of earnings is analyzed. The major linkage between the determinants and implications parts of this research is that the determinants derived from the voluntary disclosure model are included in the computation of expected disclosure.

The principal finding in the implications part of the study is that the degree of unexpected disclosure assists in the communication of earnings information to the market. This outcome is especially evident when short return windows are applied. When longer return windows are used, as in the association approach, the implications of disclosure and earnings for the market are not so obvious. In general, the results obtained from the association approach give additional evidence of the rather low returns-earnings association reported by Lev (1989) and other literature cited there.

However, when the disclosure level corresponds with expectations, the unexpected earnings variable receives a higher degree of statistical significance than it does for either unexpected low or unexpected high levels of disclosure. This result indicates the importance of disclosure in general, and it also shows the necessity of defining the return windows appropriately.

To summarize, it can be said that determinants derived from firms' own activities were better able to explain disclosure than variables derived from financial market data. This finding also indicates that special care should be taken if the direction of the relationship between disclosure and the independent variable is defined *ex ante*. Hypotheses about the relationship between disclosure and independent variables implicitly assume that disclosure is prepared for certain purposes. Consequently, actual relationships between disclosure and independent variables can provide insight into the different functions of disclosure. This line of reasoning supports the view presented in Burton (1981) and in Schipper (1981).

The implications part of the research shows that disclosed information other than earnings is relevant to the market. In particular, when the disclosure does not contain any major surprises to the market it assists the communication of earnings information.

9.4. Managerial aspects

One of the key functions of communication by management is to ensure that the true value of a firm's various operations is reflected in its share price. Users should be able to fully comprehend the information that management discloses. The means to communicate to outsiders the underlying workings of a modern corporation and its decision-making are not always readily available. Furthermore, the information itself has become a crucial competitive factor. Therefore firms may sometimes be cautious, even reluctant, to expand their disclosure of information. On the other hand, competitive capital markets require increasingly detailed information in order to attract investors to a firm. Research performed in this area has several important

implications for corporate disclosure practice. Management surely formulates and enacts the disclosure policy. Lev (1992, p. 28) states the following:

Given that without an active, long-term disclosure strategy, there is no assurance that the full value of the firm's other activities will be fully reflected in a timely manner in the various markets in which it operates, the need for a disclosure strategy arises. A disclosure strategy should be of particular interest to top management, since disclosure is among the few corporate activities practiced directly by executives, as contrasted with most other activities which are delegated to subordinates.

This need has also been recognized by firms themselves. An indication of this can be found in the communication manual of an HSE-listed firm, Huhtamäki Oy (Huhtamäki, 1993, p. 2):

Professionally managed external communications provide essential support to all key activities, such as the recruitment of qualified individuals, the marketing of innovative, value-added products, and the procurement of financial resources. In emergency situations, a company's credibility is largely measured by how well its crisis communications are handled.

Openness, however, has two kinds of limitations: those imposed by law and statutory procedures, and those dictated by company policy and commercially motivated self-restraint. Every employee should have a basic understanding of these constraints.

The above quotations illustrate some of the key dimensions in which business communication can have an important impact. On the other hand, poor external communications may result in the markets having serious difficulties in comprehending a firm's true value. Some important aspects that have to be taken into

account in firm-to-outsiders communication are discussed in the following. Business communication can also influence the composition of analysts monitoring a firm. A discussion of that issue concludes this subsection.

First, a firm's external communication has to be managed. A long-term disclosure strategy is essential if the value of the various operations of a firm is to be translated effectively into prices. Recent studies, including the present one, have found that information disclosed concurrently with earnings has incremental information value for the market. There are even findings showing that disclosure scores are higher for firms with a weaker relation between stock returns and earnings. Evidence shows that earnings figures should be supplemented with additional disclosures. The markets need to know the quality of the earnings reported: the permanence of earnings is important information for the investment community. Investors' awareness of the communication process as such is also important. Information on when a firm will publish an accounting report is essential because the markets form estimates of the content of forthcoming accounting reports, such as an interim report.

Second, the investment community needs to be able to monitor a firm's development over time. A long-term disclosure strategy will help in that effort. It should be possible to make comparisons between the current and previous years' information. The implications part of this research indicates the importance of consistent disclosure quality in interim reports. As regards income statements and balance sheets, it is fairly straightforward to make comparisons with figures for previous years even in the current reporting practice. It is also important for managers to make sector-specific

information available to investors since the characteristics of different business sectors can be very distinct.

Third, disclosures are a possible medium whereby corporations can articulate their long-term strategy and managers their opinion of how well they have succeeded in implementing that strategy. The firm's outlook in the light of the implementation of its strategy could also be discussed via the medium of disclosures. Additional disclosures should also allow comparisons and analyses of a corporation's main performance indicators to be made. That would help the investment community to have a deeper insight to the firm and its operations. It would also be easier to analyze a firm's future prospects. This, in turn, would decrease the uncertainty faced by investors in the firm's shares. This could make for a lower risk premium, making the firm's shares a more attractive investment.

Fourth, a firm's disclosure policy can also affect the degree to which the investment community searches information from secondary sources. Information based on secondary sources, rather than a firm's own announcements, could be less accurate and may only refer to part of the firm. In contrast, the information in interim and annual reports applies to the whole firm. Analyses could then be performed in a firm context.

By releasing an adequate amount of information of the appropriate quality a firm can encourage investors to use primary sources of information published by the firm itself. Functioning investor relations advance the cause of communication and consequently reduce the possibility of misunderstandings. Inadequate or even incorrectly construed

information can have harmful consequences for a firm. The modern technology used in communications also speeds up the dissemination of incorrect information. In practice it is important to designate authority to make public statements on behalf of a firm to specified persons.

Fifth, proper primary communication could also help to ensure that all market participants receive information concurrently with others. That would reduce possible problems of trading on privileged information. The credibility of accounting reports is enhanced if financial decisions are taken that are in line with the statements issued to investors.

Finally, a firm's disclosure practices can also influence what analysts monitor the firm and the quality of their earnings forecasts. More informative disclosure policies may attract large institutional investors. Good quality disclosure helps to build up confidence in a firm as an attractive investment. Another reason why analysts may be inclined to monitor firms that disclose well is the potentially improved accuracy of their earnings forecasts for those firms. That may, in turn, cause analysts to avoid firms with low quality disclosures. This is because analysts are not willing to jeopardize their reputation by releasing potentially misleading earnings forecasts.

9.5. Legislative aspects

The findings reported in this paper indicate that legislation has an impact on the level of disclosure in interim reports. It is especially important to note that the regulation of earnings alone is not sufficient. Other items also need to be regulated to some extent.

An interesting finding is that legislation and regulation also have an impact on purely voluntary disclosure in interim reports.

Despite the positive impacts which regulatory developments have had for the markets, there still seems to be a somewhat short-term view of the use of interim reports. When short measurement periods are employed, the coefficient of the unexpected earnings variable in the middle quartiles has almost always a much higher value than coefficients associated with longer return measurement periods. More research is needed to provide further understanding of: (1) how markets use disclosed information and (2) what information is useful in long-run decision making.

9.6. Suggestions for further research and concluding note

Several possible avenues suggest themselves for further research into business communication as practiced in interim reports. In order to avoid prolonging this last section, only a few suggestions for further research are made. The technical details associated with such research are not elaborated upon here.

A combination of the traditional returns-earnings approach with empirical disclosure data would add significantly to current knowledge of the use of accounting information. As indicated in this study, the degree of disclosure affects the communication of the earnings information content to the market. This principal finding could be built upon in several ways. Theoretically, a current share price can be expressed in terms of discounted earnings. Therefore it could be argued that information other than earnings strengthens the information content of the earnings

numbers. However, to date there have only been limited theoretical developments in the area of disclosure.

More research is needed to gain further understanding of how markets use earnings and disclosures. One area of research would be to study whether the disclosure of a specific information item has a different impact when disclosed in various disclosure contexts. Current research offers only limited information on this point. Furthermore, it would be interesting to examine whether there is an association between the quality of disclosure and the composition of the analysts monitoring the firm. The database compiled in this study also provides the opportunity to study whether the market implications of various interim reporting periods deviate from each others.

Similarly, additional research is called for to better understand whether different business sectors would benefit from different kinds of disclosure. Currently, Finnish legislation assumes that similar disclosure is appropriate for different types of businesses, excluding the finance and insurance sectors. It is also important to see disclosure as part of a firm's overall communications effort.

In conclusion, an interim report-specific disclosure index for both overall and purely voluntary disclosure in interim reports is constructed in this study. The major determinants of the information disclosed in interim reports are presented. This is achieved by analyzing: (1) total interim reports, including both mandatory and voluntary disclosures; and (2) all the subsets of interim reports, containing purely voluntary disclosures. The major determinants of disclosure, besides the year in which an interim report is published, are found to be: (1) business risk, (2) growth potential,

and (3) firm size. Furthermore, the implications of the information disclosed in interim reports are investigated. It is found that besides earnings, other information disclosed also enhances the value of earnings information to the market, in particular when the level of disclosure is as expected.

Appendices

Appendix A. Annotated bibliography of empirical research on corporate disclosures

Study	Sample number - source (dates)	Methods	Index	Findings
Cerf (1961)	258 NYSE, 113 other exchanges, 156 OTC firms - annual reports (July 1, 1956 - June 30, 1957)	Regression	31 weighted items, based on literature and professional analysts	A positive relation between disclosure and: (1) asset size, (2) number of stockholders, and (3) profitability exists
Copeland & Fredericks (1968)	200 NYSE listing applications (1964)	Rank correlations	6 specific indices, 1 for each of 6 specific purposes for listing a stock	A positive relation between materiality and disclosure exists. This relation, however, is statistically insignificant.
Singhvi (1968)	100 <i>Fortune</i> 500 firms, 50 OTC firms - 10-Ks, annual reports (April 1, 1965 - March 31, 1966)	Classification and tabulation	32 items, based on judgement, 4 professional analysts	Firms publish a narrower range of financial information in their annual reports than they divulge to the SEC
Singhvi & Desai (1971)	100 NYSE, 55 OTC firms - annual reports (April 1, 1965 - March 31, 1966)	Regression	34 weighted items, based on interviews with experts and literature	Firms disclosing inadequate information tend to be: (1) small, (2) free from listing requirements, (3) audited by a small CPA firm, and (4) less profitable. In addition, they tend to have more volatility in their stock prices.
Baker & Haslem (1973)	1,623 individual investors - questionnaire (undated)	Arithmetic mean, Standard deviation	33 items, based on pre-tested questionnaire	Individual investors use many items, especially to assist in the anticipation process
Choi (1973a)	72 firms that are Eurobond participants - annual reports (participants prior to July 1971)	Matched pairs	36 unweighted and weighted items, based on investor decision framework and literature	Entry to the European capital market is related to improvements in disclosure

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Appendix A (continued)

Study	Sample number - source (dates)	Methods	Index	Findings
Buzby (1974)	44 NYSE and AMEX, and 44 OTC firms - annual reports (June 30, 1970 - June 30, 1971)	Rank correlations	38 weighted items, based on literature and professional analysts	The correlation between the relative importance of the items and the extent of their disclosure is low
Chandra (1974)	600 CPAs and 400 CFAs - questionnaire (undated)	Pairwise comparison of ratings	58 items, based on literature, annual reports, professional analysts, accountants	The value of information in equity investment decisions differs between accountants and financial analysts
Barrett (1975)	103 firms, located in U.S.A. (15), Japan (15), U.K. (15), France (15), Germany (15), Sweden (15), and the Netherlands (13) - annual reports (1963-72)	Comparison of disclosure indices and subindices	17 unweighted and weighted items, based on literature and judgment	The overall extent and quality of American annual report disclosure is not better than that of British firms. In specific disclosure areas there are also differences between countries.
Buzby (1975)	see Buzby (1974) above	Matched pairs	39 weighted items, based on literature and professional financial analysts	A positive relation between disclosure in annual reports and the size of company's assets exists. Disclosure and listing status are not related.
Barrett (1976)	see Barrett (1975) above	Disclosure scores and frequencies of disclosed items	17 unweighted and weighted items, based on literature and judgment	The extent of disclosure improves throughout 1963-72. There is a wide variance between the disclosure of American and British firms, on the one hand, and the level of disclosure of firms from the other five countries, on the other. These results reinforce the view that the quality of disclosure and the degree of efficiency of national markets are related.
Stanga (1976)	80 <i>Fortune</i> 1,000 firms - annual reports (October 31, 1972 - September 30, 1973)	Disclosure scores and frequencies of disclosed items	79 weighted items, based on literature, recent annual reports, questionnaire to CFAs	Many disclosure deficiencies are reported. Firm size, among large industrial firms, is not an important factor in explaining disclosure. Industrial sector is related to the extent of disclosure.

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Appendix A (continued)

Study	Sample number - source (dates)	Methods	Index	Findings
Barrett (1977)	see Barrett (1975) above	Disclosure scores and frequencies of disclosed items	17 unweighted and weighted items, based on literature and judgment	The extent of financial disclosure in the annual reports of U.S. firms is greater on average (but not uniformly in specific categories of disclosure) than firms in Japan, Sweden, the Netherlands, Germany, and France
Benjamin & Stanga (1977)	600 commercial bank loan officers, 600 CFAs - questionnaire (undated)	Differences in rankings	79 items, based on literature and recent annual reports	For 51 of the 79 items, commercial bank officers, who make term loan decisions, and financial analysts, who make share investment decisions, value information differently
Chenhall & Juchau (1977)	1,025 active individual investors - questionnaire (1975)	Disclosure scores in different investor populations	37 items, previous literature and Accounting Standards Steering Committee	Risk-averse investors and those preferring high dividends value information on: (1) expected future dividend yields, (2) past dividend yield, and (3) ease of transfer of old shares. Investors accepting high risk and low dividends value information on: (1) leverage and (2) budgeted statements of performance and position.
Firth (1978)	750 respondents: 250 financial directors, 250 auditors, 120 financial analysts, and 130 loan officers - questionnaire (undated)	Differences in rankings	75 items, based on literature, recent annual reports, and discussions with users	Finance directors and auditors have somewhat similar views. Financial analysts and bank loan officers have somewhat similar views. However, users (analysts, officers) attach higher importance to directors' disclosures than do preparers (directors, auditors).
Firth (1979a)	100 manufacturing firms (every 10th of the <i>Times</i> 1,000 largest firms) - annual reports (1976)	Actual disclosure vs. analysts' ranking	48 weighted items, based on literature and questionnaire (120 professional financial analysts)	Disclosure levels are very low. Two major reasons are postulated: (1) preparers of annual reports are unaware of the importance of some items for users and (2) the confidential nature of some information.

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Appendix A (continued)

Study	Sample number - source (dates)	Methods	Index	Findings
Firth (1979b)	40 nonlisted manufacturing firms, 40 listed firms, and 100 listed manufacturing firms - annual reports (1976)	Disclosure scores in different groups	48 weighted items, based on literature and questionnaire (120 financial analysts)	Firms with stock market listings and large firms tend to make greater disclosures in their annual reports. The firms auditing the books of the sample firms do not affect the level of disclosure.
Garsombke (1979)	100 NYSE firms - annual reports (April 1, 1965 - March 31, 1966)	Regression	34 weighted items, identical with Singhvi & Desai (1971)	Disclosure and risk are not causally related. Disclosure is an insignificant variable in explaining firm risk.
Spero (1979)	60 firms: France (20), U.K. (20), and Sweden (20) - annual reports (1964/1967/1970/1972)	Regression	Replication of some previous indices adjusted for voluntary disclosure and 3 author's own	The firm's need for capital explained voluntary disclosure. Furthermore, disclosure increased in each sample country during the research period 1964-72.
Firth (1980)	6 different samples of manufacturing firms (3 issuing groups and 3 nonissuing groups) - annual reports (1972-73)	Differences in disclosure scores	48 unweighted and weighted items, based on literature and experts' weightings	Small firms (but not large ones) increased their disclosure when raising new finance on the stock market
Nair & Frank (1980)	38 countries - 233 accounting principles and reporting practices (1973). 46 countries - 264 principles and practices (1975).	Factor and discriminant analyses	6 classification categories for principles and practices (1973), 7 classification categories for principles and practices (1975)	The groupings of countries by disclosure practices are different from groupings based on measurement practices. Also the underlying environmental variables most closely associated with the practices are different. The results have implications for: (1) the comparability of financial statements and (2) accounting harmonization.

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Appendix A (continued)

Study	Sample number - source (dates)	Methods	Index	Findings
Amerinc & Maiocco (1981)	60 Canadian firms - annual reports (1967/1972/1977)	Differences in disclosure scores, ANOVA	42 weighted items, based on literature and judgment	Significant and consistent increases in the mean disclosure score are detected over the period examined. There is a detectable industry effect related to disclosure in 1972. 1977 may also contain this relation. Canadian firms' cross-listing on a U.S. exchange is linked to improved disclosure.
Kahl & Belkaoui (1981)	70 commercial banks from 18 countries - annual reports (1975)	Disclosure scores and disclosure consensus	30 weighted items, based on literature, judgment, professors, and CFAs	Differences exist in disclosure adequacy, internationally. U.S. banks are leaders in the extent of disclosure. A positive correlation exists between size and disclosure. There is a low consensus between producers and users on the ten disclosure items.
McNally, Eng, & Hasseldine (1982)	103 New Zealand Stock Exchange firms - annual reports (1979)	Differences in disclosure scores	41 weighted items, based on literature, recent annual reports, and pilot-test by stockbrokers	Stockbrokers and financial editors perceive the voluntary disclosure of a wide variety of items of information to be important. There is divergence between actual disclosure and the degree of disclosure perceived by external users to be desirable. Size is related to voluntary disclosure.
Firth (1984)	see Firth (1979a) above	Regression	48 weighted items, based on literature and questionnaire (120 financial analysts)	No significant association between the amount of disclosure and the level of stock market risk exists
Firer & Meth (1986)	36 Johannesburg Stock Exchange firms - annual reports (1979-83)	Differences in disclosure scores	49 weighted items, based on literature, annual reports, and questionnaire for investment analysts and financial directors	Emphasis is placed by investment analysts on: (1) predictive information items, (2) the low importance attached to inflation-related items, and (3) the high importance attached to a statement of transactions in foreign currency. Low level of correlation between South African investment analysts and U.K. counterparts was found.
Chow & Wong-Boren (1987)	52 Mexican Stock Exchange firms - annual reports (1982)	Regression	24 unweighted and weighted items, based on experts' review and literature	Large firms disclose more voluntarily than do small firms

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Appendix A (continued)

Study	Sample number - source (dates)	Methods	Index	Findings
Wallace (1988)	1,200 persons: 300 chartered accountants, 200 investors, 100 senior civil servants, 200 managers, 200 financial analysts, and 200 other professionals - questionnaire (1986)	Disclosure scores and consensus among user-groups	109 items, based on literature, regulation, and degree of controversy surrounding the issue	The major finding of the study was the lack of consensus between accountants as a user-group and all other user-groups
Cooke (1989b)	90 firms: 38 unlisted, 33 listed on the Swedish Stock Exchange, 19 listed on both the Swedish and at least 1 foreign stock exchange - annual reports (1985)	Regression	224 unweighted items, based on literature, institutional recommendations, law, and practicing accountants	Listing status and size explain the extent of disclosure
Cooke (1989c)	see Cooke (1989b) above	Regression	146 unweighted items, based on institutional recommendations, literature, and practicing accountants	Listing status and size are major explanatory variables for voluntary disclosure. In addition, firms categorized as trading disclose less voluntary information than other industries.
Gray & Roberts (1989)	212 British multinational firms - questionnaire (1984)	Interviews and disclosure rankings	34 items, questionnaire	Stock market pressures appear to dominate political pressures in encouraging voluntary disclosures. Indirect costs of competitive disadvantage are important in disclosure policy decisions.
Gibbins, Richardson, & Waterhouse (1990)	11 disclosing firms' and 9 external organizations' members (1985-86)	Interviews and several types of topical disclosures	Inventory according to the communication medium and the topic	Two-dimensional internal preference for managing disclosures is developed. The first dimension results in uncritical acceptance of rules and norms, the second results in a propensity to seek firm-specific advantage in how disclosures are made and interpreted.

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Appendix A (continued)

Study	Sample number - source (dates)	Methods	Index	Findings
Tuominen (1991)	72 publicly listed firms and firms on the broker list on the Finnish stock market - annual reports (1976/1980/1984)	Discriminant analysis, latent structure analysis, and principal component analysis	223 items, based on literature and regulation	Over time, disclosure policy has become more comprehensive and diversified
Imhoff (1992)	185 firms identified using 1982 edition of the Financial Analysts Federation's (FAF) Corporate Information Committee Report	Regression	Analysts' rating	Firms with relative high (low) accounting quality are those with more (less) predictable earnings, more (less) accurate earnings forecasts, smaller (larger) annual earnings forecast revisions after first-quarter results, lower (higher) likelihood of bad-news annual earnings, larger (smaller) size, and lower (higher) debt-to-equity ratios
Pribrjivat (1992)	63 firms operating in the Securities Exchange of Thailand - annual reports (1989)	Regression	27 unweighted and weighted items, based on literature, regulation, judgment, annual reports, and financial analysts	Level of disclosure is not related to capital costs as measured by beta and return variance. Voluntary disclosure is related to: (1) size, (2) ownership structure, (3) capital structure, and (4) audit firm (local/international). Overall, the results with unweighted and weighted indices are substantially equivalent.
Susanto (1992)	98 Jakarta Stock Exchange-listed firms - annual reports (1990)	Regression	30 weighted items, based on literature, questionnaire, and interviews	Nationality (domestic/foreign) of a firm, new regulations, and size are related to disclosure
Williams (1992)	316 firms in 13 countries - annual reports (the most recent annual report requested on February 1990)	Regression	43 weighted items, based on literature	Size and profitability are significantly and positively related to disclosure. Results also indicate that nationality is an important determinant of disclosure.
Giner Inchausti (1993, April)	138 Valencia Stock Exchange-listed firms - annual reports (1989-91)	Regression, panel data analyses	50 unweighted items, based on literature and regulation	Size, auditing firm, and listing status are related to disclosure

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Appendix A (continued)

Study	Sample number - source (dates)	Methods	Index	Findings
Lang & Lundholm (1993)	751 firms rated at least once in the 5 FAF Reports (1985-89)	Regression	Analyst ratings of disclosure categories	Disclosure scores are higher for firms that perform well, for larger firms, for firms with a weaker relation between annual stock returns and earnings, and for firms that issue securities
Price (1993)	2,533 firm/year observations obtained from Compustat and CRSP and CRSP (1984-91)	Regression, simultaneous equations (disclosure quality endogenous/ exogenous)	Disclosure quality evaluations published by the Association for Investment Management and Research (AIMR)	Management responds to institutional ownership with high quality disclosure
Welker (1993)	2,596 firm/year observations (1981-90)	Regression, simultaneous equations (disclosure quality endogenous/ exogenous)	Disclosure quality evaluations published by the AIMR	Disclosure quality reduces information asymmetry and, hence, the cost of equity capital
Gray, Meek, & Roberts (1994, April)	116 U.S., 64 U.K., and 100 Continental European multinational firms - annual reports (1989)	ANOVA	128 unweighted items, based on an analysis of international trends, actual reporting practices, and literature	The result show that there are significant differences in financial reporting between internationally listed and domestic listed firms
Raffournier (1994, April)	161 Swiss listed firms - annual reports (1991)	Regression	30 unweighted items, based on EC directives	Disclosure is related to size and degree of internationalization of a firm

(continued on next page)

Appendix A (continued)

Study	Sample number - source (dates)	Methods	Index	Findings
Sutley (1994)	116 winning and 123 nonwinning annual reports in the <i>Financial Post</i> annual report award program (1982-87)	Content analysis, regression	Disclosure quality evaluation published by <i>Financial Post</i>	Content analysis of <i>Financial Post</i> booklets indicates that the concepts of disclosure, informativeness, and usefulness to investors were important in a judge's ranking. Changes in winners' stock prices are less correlated with contemporaneous changes in earnings in the award year than those of nonwinners. In addition, winners have larger increase in return variability during the announcement week of annual report than nonwinners.
Healy, Palepu, & Sweeney (1995)	90 firms with sustained increases in disclosure ratings (1980-90)	Regression, control groups	Disclosure quality evaluations published by the AIMR	Increased disclosure appears to be effective in helping investors to value short-term earnings growth. In addition, a high level of disclosure appears to create additional consensus among investors leading to increased liquidity for the firm's stocks.

Appendix B. Detailed sources of accounting data

The following primary data sources were used in collating the accounting data:

1. *Kauppalehti* newspapers, all issues for the years 1985-87. For 1985 the data are taken from the actual newspapers and for 1986-87 the data are on microfilm. For more recent time periods, the KAUPPIS database, which is based on *Kauppalehti*, is available. The event days were systematically searched by applying an open search with *osavu*** as an entry word.
2. *Helsingin Sanomat* newspapers. Interim report announcements for 1985 (database in the Helsinki School of Economics and Business and database in the University of Oulu).
3. HSE files covering register number 30042 = osavuositiedot [interim report] from 1985, 1986, and 1987.
4. The card files of the HSE for 1985, 1986, and 1987.
5. The HSE filing program lists using osavuositiedot [interim report] as the entry word. The filing program covers the years 1988 through 1993. The run dates of the lists were: (1) 1988, date: 9.11.1990; (2) 1989, date: 6.6.1990; (3) 1.1. - 3.10.1990, date: 3.10.1990; (4) 4.10. - 16.11.1990, date: 16.11.1990; (5) 14.11. - 31.12.1990, date: 16.1.1991; (6) 1991, date: 23.4.1992; (7) 1992, date: 8.1.1993; (8) 1.1. - 31.10.1993, date: 1.11.1993; and (9) 1.11. - 31.12.1993, date: 21.1.1994.
6. The HSE filing program lists using ennakkotieto osavuositiedot [announcement of the event day of an interim report] as the entry word. This search was used to control the information in the osavuositiedot list. The run dates of the lists were: (1) 1988, date: 1.11.1993; (2) 1989, date: 1.11.1993; (3) 1990, dates: 11.10.1991, 1.11.1993; (4) 1991, date: 1.11.1993; (5) 1992, date: 1.11.1993; and (6) 1993, date: 1.11.1993.
7. Firms were requested to send a copy of their interim report when an incomplete announcement of their report was given in *Kauppalehti* in 1985.

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Appendix B (continued)

8. Some details of interim reports were also requested by telephone directly from firms. Those calls are documented on the data collection form. In cases where an interim report was published but not available in the HSE, the report was requested directly from the company. The major records for missing data and the follow-up measures are dated: 18.10.1993 (14 pages), 7.11.1993 (four pages), and 23.2.1994 (one page).
9. New listings and deletions from the Stock Exchange list were ascertained from the annual reports of the HSE (Helsinki Stock Exchange, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993). For 1993, the changes to the official list were received directly from the HSE. The exact dates of the above changes were obtained from the HSE. In addition, the listings were cross-checked using *Kauppa-lehti*.
10. Annual reports of the firms.

Appendix C. Data schedule for disclosure scoresheet

Interim report-specific disclosure scoresheet

Date of entry: _____

Firm: _____

Interim report (reporting period in months/reporting year): _____

A. Management report

A.1. Management overview

1. Review of operations for the reporting period	<u>frequencies of items</u>
0.0 review not disclosed	4
0.5 review with few comments	144
1.0 review with an analytical discussion	<u>425</u>
	573
2. Competitive position and market share	
0.0 items not disclosed	113
0.5 items with few comments	249
1.0 items with an analytical discussion	<u>211</u>
	573
3. Earnings per share (EPS)	
0.0 EPS not disclosed	427
0.5 disclosed present value of EPS	137
1.0 disclosed anticipated value of EPS for remainder of the year	<u>9</u>
	573
4. Number of employees	
0.0 figures not disclosed	180
1.0 figures disclosed	<u>393</u>
	573

(continued on next page)

 Appendix C (continued)

5. Subsequent events	
0.0 events not disclosed	310
0.5 events with few comments	201
1.0 events with an analytical presentation	<u>62</u>
	573
6. Outlook for the remainder of the operating year	
0.0 outlook not disclosed	46
0.5 outlook with few comments	403
1.0 outlook with an analytical presentation	<u>124</u>
	573
<i>A.2. Investments and finance</i>	
7. Presentation of anticipated investments	
0.0 no information on anticipated investments	315
0.5 anticipated investments disclosed with few comments	134
1.0 anticipated investments disclosed with a thorough presentation or explicitly stated that anticipated investments will be small in size	<u>124</u>
	573
8. Management discussion of financial position	
0.0 financial position not disclosed	95
0.5 financial position with few comments	277
1.0 financial position with an analytical discussion	<u>201</u>
	573
9. Presentation of anticipated capital structure	
0.0 anticipated capital structure not disclosed	412
0.5 anticipated capital structure with few comments	71
1.0 anticipated capital structure with an analytical discussion	<u>90</u>
	573

(continued on next page)

 Appendix C (continued)

B. Information in financial statements*B.1. Information in general***10. Accounting standards applied**

0.0 no information about accounting standards	11
0.5 information according to Finnish accounting standards or according to other international accounting standards	501
1.0 information according to both Finnish and some international accounting standards	<u>61</u>
	573

11. Income statement (voluntary components)

0.0 only mandatory components disclosed	91
0.5 at least two voluntary income statement components disclosed	280
1.0 all major income statement components disclosed	<u>202</u>
	573

12. Balance sheet

0.0 balance sheet not disclosed	430
0.5 at least the sum of total assets disclosed	59
1.0 all major balance sheet components disclosed	<u>84</u>
	573

*B.2. Business segment information***13. Breakdown of turnover or net sales by business segment**

X only one business segment	17
0.0 several business segments, segmental components not disclosed	122
1.0 several business segments, segmental components disclosed	<u>434</u>
	573

(continued on next page)

 Appendix C (continued)

14. Breakdown of income by business segment

X only one business segment	17
0.0 several business segments, segmental income not disclosed	515
1.0 several business segments, segmental income disclosed	<u>41</u>
	573

*B.3. Geographical information***15. Breakdown of turnover or net sales by geographical area**

X domestic turnover only	113
0.0 several areas, not disclosed	290
0.5 several areas, disclosed by domestic and foreign	118
1.0 several areas, disclosed by areas	<u>52</u>
	573

16. Breakdown of income by geographical area

X domestic income only	113
0.0 several areas, not disclosed	459
0.5 several areas, disclosed by domestic and foreign	1
1.0 several areas, disclosed by areas	<u>0</u>
	573

*B.4. Disclosure and analysis of components related to financial statements***17. Turnover or net sales**

0.0 no information on the component	1
0.5 component disclosed with few comments	212
1.0 component disclosed with an analytical discussion	<u>360</u>
	573

(continued on next page)

 Appendix C (continued)

18. Research and development (R&D)	
0.0 no information on R&D	370
0.5 R&D disclosed with few comments	157
1.0 R&D disclosed with a reasonable explanation or explicitly stated that R&D has minor importance	<u>46</u>
	573
19. Depreciations of property, plant, and equipment	
0.0 depreciations not disclosed	488
0.5 depreciations disclosed with few comments	69
1.0 depreciations disclosed with a thorough explanation	<u>16</u>
	573
20. Result after financing items	
0.0 no information on the component	142
0.5 component disclosed with few comments	306
1.0 component disclosed with an analytical discussion	<u>125</u>
	573
21. Other income and expenses	
X other income and expenses of minor importance	172
0.0 no information on other income and expenses	214
0.5 other income and expenses with few comments	117
1.0 other income and expenses with a thorough explanation	<u>70</u>
	573
22. Result before appropriations and taxes	
0.0 component disclosed without comments	46
0.5 component disclosed with few comments	351
1.0 component disclosed with an analytical discussion	<u>176</u>
	573

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 Appendix C (continued)

23. Inventories and valuation	
0.0 no information on inventories	433
0.5 inventories with few comments on valuation	135
1.0 inventories with a thorough explanation of valuation or explicitly stated that inventories are of minor importance	<u>5</u>
	573
24. Order book and the order backlog	
0.0 no information on orders	235
0.5 order book mentioned with few comments	209
1.0 order book and order backlog mentioned with a thorough presentation or explicitly stated that orders are of minor importance	<u>129</u>
	573
25. Leasing contracts	
0.0 no information on leasing contracts	498
0.5 leasing contracts with few comments	54
1.0 leasing contracts with a thorough presentation or explicitly stated that leasing contracts are of minor importance	<u>21</u>
	573
26. Commitments and contingencies	
0.0 no information on commitments and contingencies	282
0.5 commitments and contingencies with few comments	228
1.0 commitments and contingencies with a thorough explanation or explicitly stated that no commitments and contingencies	<u>63</u>
	573

Specified criteria for interpretation of a particular scoresheet item or interim report

1. The DIVOLPUR index tracks items that are purely voluntary throughout the whole research period of 1985-93. The item numbers in the disclosure scoresheet fulfilling these voluntary criteria are: 2 through 16, 18, 19, and 23. The specific classification

(continued on next page)

Appendix C (continued)

of various items or interim reports in certain years is given in statements 2 through 5 below.

2. In 1985 there were no mandatory reports or items. All interim reports published in 1985 were classified as voluntary.
3. Between 1.1.1986 and 31.12.1987, the following index item numbers were excluded from the compilation of the voluntary disclosure index: 1, 17, 21, 22, and 24. When a firm published more than one interim report, the other interim report(s) for other period(s) was (were) classified as voluntary.
4. Between 1.1.1988 and 31.12.1989, the following index item numbers were excluded from the compilation of the voluntary disclosure index: 1, 17, 20, 21, 22, and 24. When a firm published more than one interim report, the other interim report(s) for other period(s) was (were) classified as voluntary.
5. Between 1.1.1990 and 31.12.1993, the following index item numbers were excluded from the voluntary disclosure index: 1, 17, 20, 21, 22, 24, 25, and 26. Between 1990 and 1993, HSE-listed firms were given the option of publishing: (1) one six-month report or (2) two interim reports covering equal periods. In practice, this means: (1) one six-month interim report or (2) two interim reports, the first covering the first four months of the operating period, the second covering the second four months of the operating period. Interim reports exceeding these frequency requirements are classified as voluntary.

Appendix D. Elimination of correlated variables

Before a variable was included in the regression model for the determinants of disclosure, a control was undertaken for correlations with the other variables in that particular group (Rawlings, 1988, pp. 244-245). The highest correlations are as follows:

- CHGPROFI (*percentage change in profit after financial items*) and CGNETPRO (*percentage change in profit after the financial items/net sales ratio*), .99;
- SCGNETPR (*standard deviation of the percentage change in profit after the financial items/net sales ratio*) and SCGPROFI (*standard deviation of the percentage change in profit after financial items*), .99;
- CHGNETS (*percentage change in net sales*) and ANNNETSP (*percentage change in annual net sales*), .86;
- LANPERSO (*number of personnel*) and LANNETRE (*annual net sales*), .86; and
- SCGNETS (*standard deviation of the percentage change in net sales*) and SANNETSP (*standard deviation of the percentage change in annual net sales*), .73.

Appendix J gives the complete correlation matrix for the variables.

Due to the high correlation, one of the variables was always eliminated. The correlation is not merely statistical - it points to the underlying economic situation. Basically, the correlated pairs represent very similar attributes. The criterion for selecting between CHGPROFI and CGNETPRO was to use the computationally more attractive variable: CHGPROFI. The use of CHGPROFI makes SCGNETPR, and not SCGPROFI, the computationally easier measure of business risk.

One major guideline in selecting between correlated variables was to use as much interim report information as possible instead of annual information. Therefore CHGNETS and SCGNETS were used in place of the annual variables ANNNETSP and SANNETSP.

Finally, LANPERSO was selected for further analysis instead of LANNETRE because it was considered to be less ambiguous than LANNETRE. In particular, LANPERSO was applied because it is immune to changes in money value, is less affected by year-end adjustments than LANNETRE, and because the values for LANPERSO were more readily available than for LANNETRE.

For the above reasons, the variables CGNETPRO, SCGPROFI, ANNNETSP, LANNETRE, and SANNETSP were excluded from further analysis. This left: (1) CHGPROFI, (2) SCGNETPR, (3) CHGNETS, (4) LANPERSO, and (5) SCGNETS.

Appendix E. Reporting lags in business days, 1985 through 1993

Lag ^a	1985	1986	1987	1988	1989	1990	1991	1992	1993
Average	33.9	36.9	34.5	35.1	34.8	36.3	36.5	33.4	33.5
Minimum	15	17	13	14	13	23	24	14	19
Maximum	62	68	60	63	79	45	45	43	46
<i>N</i>	45	50	53	60	75	82	70	73	69

^a *Lag* is defined as the number of days from the end of the reporting period through the announcement date. The total number of data available for the computation of the reporting lag is 577.

Appendix F. Descriptive statistics of variables used

Variable	N	Minimum	Q ₁	Median	Q ₃	Maximum	Mean	Variance	Skewness	Kurtosis	Jarque-Bera
DIALL	573	.05769	.30769	.40385	.48077	.71154	.39580	.01438	-.18833	-.36433	6.55635
DIVOLPUR	573	.05555	.27777	.36111	.44444	.69444	.35259	.01401	-.13558	-.40221	5.61782
LHOLNU	587	.69315	8.00970	8.85367	9.76629	11.54248	8.84618	1.91558	-.78112	3.09008	293.23593
FIRMS	567	.00000	13.10000	29.50000	51.20000	99.80000	34.19788	712.21160	.59950	-.59050	42.20096
SCGNETS	595	.01147	.10729	.16507	.21439	8.59526	.37354	1.47573	6.36501	39.99604	43,676.39090
SNIQKPOP	547	.83897	4.10468	5.84546	8.59250	28.80975	7.46467	33.99134	2.00003	4.25611	777.53585
ANNBETA	573	-.38400	.39800	.63200	.95200	2.27700	.67888	.15120	.51394	.26959	26.95970
ANNDEBTS	468	-16.60000	1.10000	1.70000	2.70000	30.60000	2.25620	9.49412	3.94130	42.88086	37,067.61650
ISSRATIO	411	-.25786	.00000	.00000	.26437	10.45455	.28341	.61602	7.02665	73.96508	97,070.12120
POSBCAR	440	-1.01700	-.17000	.01150	.16750	.80200	.00723	.07230	-.01872	.96678	17.16115
CHGNETS	562	-.81494	-.00772	.08462	.18542	29.94937	.19012	1.81470	19.80492	428.95870	4,345,536.340
NIQKPOP	451	-23.90900	4.66100	7.61600	13.03600	60.11600	9.00037	85.29732	1.38837	7.65450	1,245.91819
PROFNETP	533	-.24065	.00313	.03054	.06339	.41325	.03436	.00522	.52341	4.22711	421.16565
LANPERSO	589	3.73767	7.32449	8.38275	9.26407	10.70522	8.22995	1.85969	-.64778	.12253	41.56088
UPVD	255	-.22609	-.04213	.00662	.04460	.25000	.00645	.00531	.20663	.84211	9.34929
UE	450	-9.70642	-.25882	.07740	.37180	50.08152	.10026	8.04893	12.12394	216.08620	886,522.6034
SDR	507	.02800	.24500	.52400	1.12000	10.84600	.90713	1.28357	3.39831	17.73971	7,623.82986

For detailed variable definitions, see sections 6.1.4, 7.1.1, 8.2, and 8.4 in the text.

Appendix G. Analyses for multicollinearity in the final regressions

Appendix G-1. Analysis of the DIALL regression (table 1 in the text)

Dependent variable	R^2	VIF
FIRMS	.397	1.66
SCGNETS	.302	1.43
SNIQKPOP	.278	1.38
ANNBETA	.414	1.71
ISSRATIO	.173	1.21
POSBCAR	.128	1.15
CHGNETS	.424	1.74
PROFNETP	.404	1.68
LANPERSO	.508	2.03

DIALL = index of all interim reports including both mandatory and voluntary disclosures, and

VIF = variance inflation factor: $1 / (1 - R^2)$.

All variables in regressions:

FIRMS = percentage of corporate ownership,

SCGNETS = standard deviation of percentage change in net sales,

SNIQKPOP = standard deviation of net investments/total assets ratio,

ANNBETA = market model beta,

ISSRATIO = ratio of change in equity/equity before the change,

POSBCAR = post-event cumulative abnormal return (CAR) at business day 140. Expected returns are based on the market model.

CHGNETS = percentage change in net sales,

PROFNETP = profit/net sales ratio, and

LANPERSO = natural logarithm of the number of personnel.

The variables FIRMS, SCGNETS, SNIQKPOP, ANNBETA, ISSRATIO, POSBCAR, CHGNETS, PROFNETP, and LANPERSO are regressed one by one in multiple regressions on the other independent variables.

The above results quite strongly support the view that serious multicollinearity does not exist among the independent variables. The highest R^2 , 50.80%, is obtained when

the dependent variable is LANPERSO. For the rest of the regressions in the table above, the R^2 is below 50.00%. In other words, multicollinearity has only a small influence on the results. Also, the variance inflation factor (VIF), a measure of collinearity, indicates that there is no overall collinearity problem in the current sample. Rawlings (1988) suggests $VIF > 10$ as a guideline for serious collinearity (op. cit., p. 277). All VIFs are clearly below 10 in this set of observations.

Appendix G-2. Analysis of the DIVOLPUR regression (table 2 in the text)

Dependent variable	R^2	VIF
LHOLNU	.442	1.79
FIRMS	.321	1.47
SCGNETS	.100	1.11
SNIQKPOP	.297	1.42
ANNBETA	.458	1.85
ANNDEBTS	.338	1.51
POSBCAR	.130	1.15
NIQKPOP	.144	1.17
PROFNETP	.532	2.14
LANPERSO	.519	2.08

DIVOLPUR = index of all interim reports containing purely voluntary disclosures only, and

VIF = variance inflation factor: $1 / (1 - R^2)$.

All variables in regressions:

LHOLNU = natural logarithm of the number of shareholders,

FIRMS = percentage of corporate ownership,

SCGNETS = standard deviation of percentage change in net sales,

SNIQKPOP = standard deviation of net investments/total assets ratio,

ANNBETA = market model beta,

ANNDEBTS = debt/equity ratio,

POSBCAR = post-event cumulative abnormal return (CAR) at business day 140.

Expected returns are based on the market model.

NIQKPOP = net investments/total assets ratio,

(for other table footnotes see next page)

Appendix G-2 (continued)

PROFNETP	=	profit/net sales ratio, and
LANPERSO	=	natural logarithm of the number of personnel.

The variables LHOLNU, FIRMS, SCGNETS, SNIQKPOP, ANNBETA, ANNDEBTS, POSBCAR, NIQKPOP, PROFNETP, and LANPERSO are regressed one by one in multiple regressions on the other independent variables.

The above results show that there is not serious multicollinearity among the independent variables. The highest R^2 , 53.20%, is obtained when the dependent variable is PROFNETP. In eight regressions out of ten, the R^2 is below 50.00%. See appendix G-1 above for more details and a discussion.

Appendix H. Heteroscedasticity-corrected results for the implications part

Appendix H-1. White-adjusted regressions of unexpected earnings and variations in returns on CAR with long measurement windows

		Disclosure quartile: unexpected purely voluntary disclosure (UPVD)											
CAR(bgn, d)		Lower quartile ^b				Middle quartiles ^c				Upper quartile			
d	A ₀	UE	SDR	Adj. R ²	A ₀	UE	SDR	Adj. R ²	A ₀	UE	SDR	Adj. R ²	
end	.139	.060	-.125	30.2%	.080	.046	-.036	0.0%	.091	.040	.005b	2.3%	
-30	.150	.048	-.100	29.0	.126	.096	-.018	12.4	.110	.030	.014a	1.1	
-15	.138	.055	-.110	29.4	.122	.109	-.019	12.6	.101	.041	.010b	3.5	
0	.437	.693	.026	2.5	2.306	-.030	-.614	0.4	2.402	.257	-2.332a	8.0	
15	.140	.062	-.148	31.7	.120	.138	-.032	15.1	.081	.038	.000b	1.2	
30	.149	.064	-.167	31.2	.121	.134	-.043	13.1	-.081	.046	.074b	-1.9	

a: n = 63; b: n = 64; and c: n = 127.

CAR(bgn, d) = cumulative abnormal returns starting from the beginning day of the interim reporting period *bgn* and ending on day *d*. Expected returns are based on the market model. A negative/positive sign for a day indicates a pre/post-event day. *End* refers to the end day of the interim reporting period.

A₀ = intercept,

(for other table footnotes see next page)

Appendix H-1 (continued)

UE = unexpected earnings where the forecast is based on a seasonal random walk model. UE is deflated by the market value of the equity at the beginning of interim reporting period.

SDR = standard deviation of returns during the 61 business days: (-30, 30).

The unexpected disclosure class boundaries are as follows: (1) lower quartile, $UPVD < -.04212$; (2) middle quartiles, $-.04212 \leq UPVD < .04460$; and (3) upper quartile, $.04460 \leq UPVD$. **Boldface (italic boldface)** designates statistical significance at the **5% (0.1%)** level.

In the Adj. R^2 columns this notation indicates statistical significance of the F test.

Appendix H-2. White-adjusted regressions of unexpected earnings and variations in returns on CAR with short and intermediate measurement windows

Disclosure quartile: unexpected purely voluntary disclosure (UPVD)												
CAR	Lower quartile ^b				Middle quartiles ^c				Upper quartile			
	B ₀	UE	SDR	Adj. R ²	B ₀	UE	SDR	Adj. R ²	B ₀	UE	SDR	Adj. R ²
(-20, 20)	2.710	1.733	-0.656	3.0%	4.540	1.273	-0.280	0.2%	3.053	-0.656	-1.063a	-2.6%
(-20, -1)	1.090	1.041	-0.635	6.1	2.771	-0.720	-0.763	1.5	2.922	0.358	-1.906a	2.2
(0, 20)	1.620	0.692	-0.022	-1.2	1.770	1.993	0.483	4.9	0.131	-1.014	0.844a	3.3
<i>Panel A: Intermediate periods - Enveloping, pre- and post-event</i>												
(-20, -16)	0.807	0.430	-1.485	7.3%	0.622	-0.663	-0.295	3.0%	0.636	-0.054	0.089a	-3.2%
(-15, -11)	0.483	0.772	1.413	7.6	0.351	0.130	0.330	-0.4	0.883	-0.139	-0.613a	-0.3
(-10, -6)	-0.315	-0.360	0.181	2.3	0.792	-0.060	-0.640	3.6	1.001	0.183	-0.837a	3.4
(-5, -1)	0.115	0.200	-0.744	3.9	1.006	-0.127	-0.159	-1.2	0.402	0.368	-0.545a	4.3
(0, 0)	-0.461	0.341	0.123	3.7	-0.155	0.608	0.127	5.1	0.361	-0.140	-0.383a	-1.3
(0, 1)	0.107	0.481	-0.662	15.6	0.611	1.648	-0.478	17.9	0.617	0.233	-1.070a	6.8
(0, 2)	-0.565	0.130	-0.488	-1.6	0.834	1.909	-0.327	17.2	0.592	0.372	-0.740a	6.2
(0, 3)	-0.366	0.103	-0.182	-2.8	1.296	1.478	-0.758	12.6	0.672	1.461	-1.570a	37.9
(0, 4)	-0.305	-0.051	-1.007	-1.2	1.253	1.673	-0.563	13.1	0.691	1.145	-1.024a	20.1
(0, 5)	-0.159	0.124	-0.419	-2.2	0.944	1.067	-0.423	4.3	0.175	0.897	-0.717a	12.5
(0, 15)	0.644	0.584	0.525	-1.7	1.386	0.932	-0.239	0.7	0.197	-1.174	0.370a	3.8
(6, 10)	0.605	0.037	0.260	-2.9	-0.102	-0.439	0.228	0.2	0.438	-0.928	-0.330b	3.1
(11, 15)	0.199	0.423	0.684	0.8	0.544	0.303	-0.044	-0.8	-0.437	-1.145	1.422b	23.3
(16, 20)	0.976	0.108	-0.547	-1.1	0.383	1.061	0.722	5.2	-0.208	0.143	0.508b	-2.1

(for table footnotes see next page)

Appendix H-2 (continued)

a: $n = 63$; b: $n = 64$; and c: $n = 127$.

CAR($d1, d2$) = cumulative abnormal returns, starting from day $d1$ and ending on day $d2$. Expected returns are based on the market model. A negative/positive sign for a day indicates pre/post-event day.

B_0 = intercept,

UE = unexpected earnings (forecast based on seasonal random walk model), and

SDR = standard deviation of returns during the 61 business days: (-30, 30).

The unexpected disclosure class boundaries are as follows: (1) lower quartile, $UPVD < -.04212$; (2) middle quartiles, $-.04212 \leq UPVD < .04460$; and (3) upper quartile, $.04460 \leq UPVD$. **Boldface (italic boldface)** designates statistical significance at the **5% (0.1%)** level. In the

Adj. R^2 columns this notation indicates statistical significance of the F test.

Appendix I. Cross-tabulation of unexpected purely voluntary disclosure (UPVD) and unexpected earnings (UE)

Unexpected earnings quartile	Unexpected voluntary disclosure quartile				Total
	First	Second	Third	Fourth	
First					
frequency	15	15	18	15	63
row percentage	23.81	23.81	28.57	23.81	
Second					
frequency	25	17	14	8	64
row percentage	39.06	26.56	21.88	12.50	
Third					
frequency	14	13	17	20	64
row percentage	21.88	20.31	26.56	31.25	
Fourth					
frequency	10	19	14	21	64
row percentage	15.63	29.69	21.88	32.81	
Total					
percentage	64	64	63	64	255
	25.10	25.10	24.71	25.10	100.00

$\chi^2(9)=16.24, p=.062.$

Appendix J. Correlation matrix for the variables

	DIALL	DIVOLPUR	LHOLNU	INDIV	ASSOC
	1	2	3	4	5
2 DIVOLPUR	0.93922				
3 LHOLNU	0.35436	0.38425			
4 INDIV	-0.35250	-0.28657	-0.10141		
5 ASSOC	-0.14357	-0.03950	0.23992	0.36566	
6 FIRMS	-0.13774	-0.14232	-0.34048	-0.23807	-0.19266
7 BANKS	0.01791	0.02810	0.04690	-0.20060	-0.00936
8 INSUR	-0.04222	0.01563	0.16987	-0.14302	0.21034
9 SCGNETS	0.06567	0.06753	-0.12386	-0.26289	-0.12278
10 SPROFNTP	0.02154	-0.07541	-0.22993	-0.41548	-0.38193
11 SCGPROFI	0.21125	0.19738	0.17882	-0.20620	-0.28894
12 SCGNETPR	0.21776	0.19660	0.19384	-0.21626	-0.27094
13 SANNETSP	0.14209	0.14942	0.11228	-0.18612	0.03260
14 SNIQKPOP	-0.05753	-0.06013	-0.15798	-0.21522	-0.13888
15 ANNBETA	0.26509	0.24023	0.54106	-0.22378	0.01550
16 ANNDEBTS	0.21977	0.17573	-0.24531	-0.35650	-0.28559
17 ISSRATIO	0.00671	0.00553	0.02327	-0.01777	0.01652
18 PREBCAR	0.14692	0.14909	0.10285	-0.04274	0.01562
19 POSBCAR	-0.00087	-0.00129	-0.03348	-0.06379	0.04371
20 CHGNETS	-0.13369	-0.04947	-0.03930	-0.06872	0.01690
21 ANNNETSP	-0.11309	-0.02413	0.00024	-0.03784	0.04203
22 NIQKPOP	0.03965	0.07594	0.08169	-0.02656	0.08115
23 BMRATIO	0.24451	0.21097	-0.02457	0.03148	-0.24788
24 PROFNETP	-0.39791	-0.34445	0.00125	0.29024	0.27393
25 CHGPROFI	-0.19314	-0.16708	-0.03301	0.08794	0.09575
26 CGNETPRO	-0.18260	-0.16368	-0.02048	0.08920	0.09320
27 LANNETRE	0.55154	0.58843	0.72796	-0.27626	0.03799
28 LANPERSO	0.51477	0.52140	0.68293	-0.23892	0.08653
29 UPVD	0.50914	0.62030	-0.01507	-0.04705	0.00915
30 UE	-0.20109	-0.18876	0.10877	0.03855	0.12599
31 SDR	0.01571	-0.02324	-0.30276	-0.10675	-0.11496

(continued on next page)

Appendix J (continued)

	FIRMS 6	BANKS 7	INSUR 8	SCGNETS 9	SPROFNTP 10
7 BANKS	-0.08760				
8 INSUR	0.13857	0.30904			
9 SCGNETS	0.13959	0.36543	0.19980		
10 SPROFNTP	0.33801	-0.01744	0.00892	0.07857	
11 SCGPROFI	0.11750	-0.08778	0.00457	0.03551	0.19282
12 SCGNETPR	0.15342	-0.09164	0.02481	0.02070	0.20341
13 SANNETSP	0.22359	0.25494	0.29424	0.72731	0.09140
	FIRMS 6	BANKS 7	INSUR 8	SCGNETS 9	SPROFNTP 10
14 SNIQKPOP	0.53050	0.07179	0.38695	0.20084	0.50980
15 ANNBETA	-0.35742	0.06314	0.06694	0.00598	0.02822
16 ANNDEBTS	0.21956	0.08660	-0.14146	0.06957	0.34119
17 ISSRATIO	-0.00697	0.15242	0.01619	-0.00024	-0.02135
18 PREBCAR	-0.04892	-0.07717	-0.03120	0.01106	-0.08879
19 POSBCAR	0.00947	-0.02280	-0.01236	0.08169	-0.14753
20 CHGNETS	-0.00452	0.26546	0.30972	0.42247	-0.05177
21 ANNNETSP	-0.04462	0.29731	0.23469	0.40752	-0.08334
22 NIQKPOP	-0.04246	0.00920	0.04667	0.00936	0.02885
23 BMRATIO	-0.20436	-0.00731	-0.28457	-0.02897	-0.02040
24 PROFNETP	-0.08794	0.00925	0.26319	-0.06075	-0.08487
25 CHGPROFI	-0.03373	0.10794	0.18764	0.05780	-0.02469
26 CGNETPRO	-0.03334	0.07645	0.16813	0.01275	-0.00741
27 LANNETRE	-0.29527	0.09684	0.04528	-0.06613	-0.10578
28 LANPERSO	-0.42070	0.13325	0.06348	-0.07956	-0.22359
29 UPVD	0.00551	-0.03080	-0.02258	-0.05130	-0.03027
30 UE	0.03370	0.08514	0.17773	0.06259	-0.17724
31 SDR	0.18260	0.02402	-0.07932	0.01596	0.19104
	SCGPROFI 11	SCGNETPR 12	SANNETSP 13	SNIQKPOP 14	ANNBETA 15
12 SCGNETPR	0.99130				
13 SANNETSP	0.34837	0.37711			
14 SNIQKPOP	0.23580	0.28164	0.39965		
15 ANNBETA	0.12503	0.13589	0.07742	-0.14001	
16 ANNDEBTS	0.15369	0.15548	0.07985	0.08342	-0.01084
17 ISSRATIO	-0.02712	-0.04087	0.01823	-0.03812	0.09442
18 PREBCAR	0.05613	0.05936	0.07127	-0.07849	0.12335
19 POSBCAR	-0.00809	0.00052	0.05216	-0.01711	0.01177

(continued on next page)

	SCGPROFI	SCGNETPR	SANNETSP	SNIQKPOP	ANNBETA
	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>
20 CHGNETS	0.01268	-0.00895	0.29816	0.11166	0.04929
21 ANNNETSP	-0.00227	-0.02750	0.28556	0.04602	0.08392
22 NIQKPOP	-0.01708	-0.02951	0.04722	-0.05244	0.10583
23 BMRATIO	-0.04148	-0.02471	-0.04353	-0.15240	0.02799
24 PROFNETP	-0.09719	-0.10609	-0.02160	0.09599	-0.03600
25 CHGPROFI	-0.04789	-0.03946	0.02725	0.20410	0.04465
26 CGNETPRO	-0.04443	-0.03681	-0.00651	0.19914	0.03565
27 LANNETRE	0.18250	0.18993	0.06385	-0.21120	0.53144
28 LANPERSO	0.18014	0.17933	0.04045	-0.35544	0.55055
29 UPVD	0.00542	-0.00236	-0.05186	-0.00162	0.04034
30 UE	-0.03234	-0.02905	0.03664	0.05915	0.01489
31 SDR	-0.00854	-0.00278	-0.01657	0.13351	-0.15465

	ANNDEBTS	ISSRATIO	PREBCAR	POSBCAR	CHGNETS
	<i>16</i>	<i>17</i>	<i>18</i>	<i>19</i>	<i>20</i>
17 ISSRATIO	-0.00499				
18 PREBCAR	0.11669	-0.18932			
19 POSBCAR	-0.01593	-0.12305	0.03203		
20 CHGNETS	-0.19369	0.21994	-0.08233	-0.10757	
21 ANNNETSP	-0.16882	0.21567	0.01386	-0.01021	0.86246
22 NIQKPOP	-0.05663	-0.01456	0.06592	-0.14504	0.19531
23 BMRATIO	0.31489	-0.06741	0.20769	0.04752	-0.28157
24 PROFNETP	-0.55541	0.05225	-0.19139	-0.07455	0.30154
25 CHGPROFI	-0.24441	0.11166	-0.09400	-0.01496	0.13701
26 CGNETPRO	-0.25598	0.11011	-0.10115	-0.03171	0.09789
27 LANNETRE	0.00377	0.08432	0.05119	-0.04572	-0.01726
28 LANPERSO	-0.06574	0.09777	0.11982	-0.00932	0.00493
29 UPVD	-0.00469	-0.00145	0.03397	0.00476	0.02070
30 UE	-0.43926	0.12315	-0.10271	-0.15149	0.27644
31 SDR	0.27222	-0.04890	-0.02821	0.06359	-0.04859
	ANNNETSP	NIQKPOP	BMRATIO	PROFNETP	CHGPROFI
	<i>21</i>	<i>22</i>	<i>23</i>	<i>24</i>	<i>25</i>
22 NIQKPOP	0.24756				
23 BMRATIO	-0.23034	-0.10011			
24 PROFNETP	0.24499	0.11785	-0.51081		
25 CHGPROFI	0.17633	0.05482	-0.20550	0.46200	
26 CGNETPRO	0.13117	0.03892	-0.20210	0.46285	0.98906

(continued on next page)

Appendix J (continued)

	ANNNETSP	NIQKPOP	BMRATIO	PROFNETP	CHGPROFI
	21	22	23	24	25
27 LANNETRE	0.02572	0.09362	0.13240	-0.19872	-0.09690
28 LANPERSO	0.12338	0.22749	0.08928	-0.20271	-0.09592
29 UPVD	0.03129	-0.00109	-0.00490	0.05144	0.02822
30 UE	0.24199	0.03707	-0.52870	0.59625	0.40509
31 SDR	-0.11404	-0.09707	0.16739	-0.23290	-0.08540
	CGNETPRO	LANNETRE	LANPERSO	UPVD	UE
	26	27	28	29	30
27 LANNETRE	-0.08464				
28 LANPERSO	-0.08547	0.86188			
29 UPVD	0.02798	0.12101	0.05371		
30 UE	0.41830	-0.00199	0.00920	0.01943	
31 SDR	-0.08256	-0.31937	-0.30885	0.06282	-0.35173

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