An Analysis of the Impact of Varying Levels of Interim Disclosure on Finnish Share Prices within Five Days of the Announcement

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Abstract

This research examines the relationship between interim reports submitted to the Helsinki Exchanges and the share prices of reporting firms over the over the period 1985-93. The purpose of this investigation is to determine the differences in magnitude and timing of price changes associated with three levels of voluntary disclosure: (1) less-than expected, (2) about-as expected and (3) greater-than expected. The findings are that price adjustments begin on the announcement day for firms that report in magnitudes about-as expected. The share prices initially rise above the association period value, confirming DeBondt & Thaler (1985). Then, share prices decline to the association period value, confirming Daniel, Hirshleifer & Subrahmanyam (1998). This helps resolve an apparent empirical conflict. The reaction is delayed by one day for firms reporting in less-than expected amounts. The market reaction is delayed three days for firms reporting in greater-than expected magnitudes. This provides the additional insight that the amount of interim information disclosed matters to the investor: a finding that contradicts the efficient markets hypothesis (Fama, 1970). This research is concerned with the magnitude of reporting, only. Further insights may be gained in subsequent research focusing on the quality of the reports.

Key Words: CAR; Earnings Quality; Interim Reports; Voluntary Disclosure

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I. INTRODUCTION

The importance of financial reporting to the investor has been the subject of investigation for many years. Classical theory argues that share prices are worth a given amount and that the financial statements measure that amount (Edwards & Bell, 1961). Later, the efficient markets hypothesis suggested that financial statements do not matter at all (Fama, 1970). The pendulum has swung since then.

Schadewitz, Kanto, Kahra & Blevins (2001) discover not only that interim disclosure matters to investors, but also that pattern in their response to varying degrees of interim disclosure exists. The major information impulse, caused by the announcement, may be characterized as a *reaction period*. After pre-event overreaction or under-reaction, the market converges toward the ultimate earnings/price relationship in what might be called an *adjustment period*. The whole market then settles into an *association period* that reflects the ultimate earnings/price relationship suggested by all information that is then publicly available and digested.

The five day examination periods used by Schadewitz, Kanto, Kahra & Blevins (2001) allow a good description of the *pattern* of market response to varying levels of disclosure. The five day periods are, however, too wide to capture the *timing* of the onset of market response associated with varying levels of disclosure. The purpose of this research is to provide further definition of these relationships.

This study compares a controlled earnings/price relationship existing in three regimes of voluntary interim disclosure. The existence of differences among the three levels of disclosure indicates the importance of interim reporting. Specifically, this study discovers that investors in

the HEX react to interim releases on the day they are published. The share price quickly rises above the association value. This confirms the finding of DeBondt & Thaler (1985). Following that, the share prices gradually decline to the association value. This confirms the Daniel, Hirshleifer & Subrahmanyam (1998) finding. Thus, the research reported here resolves an apparent empirical conflict. The two studies, simply, take measurements at different stages of the adjustment cycle.

In addition, this research discovers that the degree of disclosure has an impact on investor response. This is contradictory to the Fama (1970) efficient markets hypothesis. When the quantity of disclosure is less-than expected, the process is delayed by one day. The process is delayed by three days, when the level of disclosure is greater-than expected. This finding provides a practical dimension for those who prepare or use interim reports.

II. BACKGROUND

Since Ball & Brown (1968), there is accumulating evidence that reported earnings contain information that is useful to stock markets. Yet, in major stock markets, earnings are found to have only limited ability to explain price behavior. Three types of evidence show the inability of earnings to convey all information necessary to determine value. One, current earnings are but a surrogate for future cash flows. As a result, the explanatory power of earnings, alone, is relatively low (Collins & Kothari, 1989; Lev, 1989; Ou & Penman, 1989; Lev & Thiagarajan, 1993; Bryan, 1997; Collins, Maydew & Weiss, 1997; Abarbanell & Bushee, 1998). Two, the value determining information embodied in earnings is not completely extracted by market participants (Bernard & Thomas, 1989, 1990; Ball, 1992; Ball & Bartov, 1996). Three, earnings data may be misinterpreted by investors.

Hong & Stein (1999) recognize that investor decision making often leads to over- or under-reaction to new information. Barberis, Shleifer & Vishny (1998) explain market over- and under-reaction by the psychological notion that people pay too much attention to the subjective strength of the evidence and too little attention its statistical weight. While the literature is in agreement that misinterpretation exists, the direction of the errors is inconclusive. DeBondt & Thaler (1985) suggest that investors *overreact* to new public information. In *apparent* contrast, Daniel, Hirshleifer & Subrahmanyam (1998) theorize that, while investors overreact to private information, they *underreact* to new public information. Thus: (1) not all information that is useful for share price valuation is provided by reported earnings, (2) even information conveyed in earnings takes the market some time to assimilate and (3) markets temporarily misunderstand earnings information.

Phenomena similar to those observed in mature stock markets also occur in emerging markets (Barry & Lockwood, 1995). The HEX provides an example. One, low earnings response coefficients (ERCs) are found by Martikainen (1990) for annual earnings and by Schadewitz (1996) for interim earnings. Two, the slow market adjustment to reported earnings is discovered by Martikainen, Yli-Olli & Gunasekaran (1991) for annual earnings and by Schadewitz & Blevins (1998a) for interim earnings. Three, Schadewitz, Kanto, Kahra & Blevins (1999) report the existence of temporary misinterpretation of new reported interim earnings. Interim non-earnings disclosures are an important element in reducing all three of these problems (HETI News, 1996; Schadewitz, Kanto, Kahra & Blevins, 2000b). Interim non-earnings disclosures: (1) can add value related information, (2) may speed the process of assimilating value related information and (3) may reduce the misunderstanding of value related information.

The sample consists of all interim reports submitted to the HEX by non-insurance and non-financial institutions sector firms over the period 1985-93. Some of the arguments supporting the

4

use of Finnish interim reports, over this selected period, are given below.

One, although the HEX is one of the most technically advanced in the world, its small size often classifies it as an emerging market (IFC, 1993). The HEX is semi-strong inefficient (Schadewitz & Blevins, 1998b). This is characteristic of thin markets, in general, and emerging markets, in particular. Adjustment lags, typical of thin markets, also exist in mature markets. Thus, the adjustment patterns found in emerging markets may simply be more prominent than those in mature markets.

Two, 1985 is the first calendar year that interim reports are systematically filed with the HEX. Specific items to be reported in interim reports are first mandated in 1986. 1993 is the ending year, due to the lead time necessary to construct the interim report database. It should be noted, however, that the research period applied should contain all the relevant legislative issues that are currently valid.

Three, Finnish corporations typically announce preliminary annual results (Troberg, 1992). Therefore, much of the information content of the final annual report is anticipated before its announcement. With interim reports, however, there is virtually no formal pre-announcement (Schadewitz & Vieru, 1993). This gives Finnish interim reports the potential of containing previously unpublished information.

Four, Finnish interim reports are relatively free of artificial distortions. Dividends and taxes are computed and paid on a firm's annual earnings (Schadewitz & Blevins, 1997b). Therefore, managers can quite openly report actual operating results in interim reports without direct dividend or tax consequences (Kanniainen & Kurikka, 1984).

Finally, Schadewitz, Kanto, Kahra & Blevins (2001) applied a 41 business day return window in order to refine the results of their 61 day study (Schadewitz, Kanto, Kahra & Blevins, 1999). With shorter windows they discovered a market cycle that can be characterized chronologically as: (1) anticipation, (2) event, (3) reaction, (4) adjustment, (5) association and (6) transition.

The research reported here suggests an answer to the apparent discrepancy in the overreaction reported by DeBondt & Thaler (1985) and the under-reaction reported by Daniel, Hirshleifer & Subrahmanyam (1998). When disclosures are about-as expected, the reaction pattern during the first five days on and after the event confirm the Daniel, Hirshleifer & Subrahmanyam (1998) theory that investors *underreact* to public information. Almost surprisingly, the findings of this research also confirm the DeBondt & Thaler (1985) argument that markets initially *overreact* to new information. The resolution of these apparently contradictory notions is in the *timing*. On the event day, the market's reaction is incomplete, confirming the findings of Daniel, Hirshleifer & Subrahmanyam (1998). The next four days, the

response climbs above the level it should, confirming the earlier DeBondt & Thaler (1985) findings. The market, within three weeks, settles at the justifiable level (Schadewitz, Kanto, Kahra & Blevins, 2001).

The present paper finds that disclosure matters a great deal to the investor. This is contradictory to the efficient markets hypothesis (Fama, 1970). Further, the adjustment pattern is delayed one day and is not as pronounced when the disclosure level is lower-than expected. The reaction pattern is delayed three days and is not as pronounced when the level of disclosure is greater-than expected. This adds a practical dimension to the research.

II.   METHODOLOGY

This research investigates magnitude and timing of price changes associated with three levels of disclosure: (1) less-than expected, (2) about-as expected and (3) greater-than expected. There are many ways this research could be conducted. The method selected involves the development of a cumulative abnormal return (CAR) model to identify the magnitude and timing of post announcement drift the first five days after an interim earnings announcement. A disclosure index is developed to identify the relationship between the magnitude of disclosure and the associated share price. The CAR model is partitioned by time blocks:. These are: (1) the day before, (2) the day of and (3) a cumulative five days after an interim announcement.

CAR is used in this study, instead of bid-ask spreads, because the cumulative effect of CAR appears to be less sensitive to noise than do bid-ask spreads. In spite of this, CAR and bid-ask results are essentially, equivalent (Schadewitz & Blevins, 1997d).

The partitioning device, used to measure the impact of varying degrees of disclosure follows Neter, Wasserman & Kutner (1990). Other studies use one or more interaction terms in the

regression for the measurement (Lundholm & Myers, 2001). Either provides the ability to analyze the movement of price changes associated with the degree of disclosure.

Since Ball & Brown (1968), there is accumulating evidence that reported earnings contain information that is useful to stock markets. Yet, in major stock markets, earnings are found to have only limited ability to explain price behavior. There are three reasons for the inability of earnings to convey all useful valuation information. One, because current earnings are but a surrogate for future cash flows, the explanatory power of earnings, alone, is relatively low (Collins & Kothari, 1989; Lev, 1989; Ou & Penman, 1989; Lev & Thiagarajan, 1993; Bryan, 1997; Collins, Maydew & Weiss, 1997; Abarbanell & Bushee, 1998). Two, not all earnings information is used (Bernard & Thomas, 1989, 1990; Ball, 1992; Ball & Bartov, 1996). Three, earnings data may be misinterpreted (Barberis, Shleifer & Vishny, 1998; Hong & Stein, 1999).

Phenomena similar to those observed in mature stock markets also occur in emerging markets (Barry & Lockwood, 1995). The HEX provides an example. One, low earnings response coefficients (ERCs) are found by Martikainen (1990) for annual earnings and by Schadewitz (1996) for interim earnings. Two, a slow market adjustment to reported earnings is discovered by Martikainen, Yli-Olli & Gunasekaran (1991) for annual earnings and by Schadewitz & Blevins (1998a) for interim earnings. Three, Schadewitz, Kanto, Kahra & Blevins (1999) report the existence of temporary misinterpretation of interim earnings news.

Since earnings are not the sole value-determining factor, interim non-earnings disclosures are investigated as an additional source of value determining information (HETI News, 1996; Schadewitz, Kanto, Kahra & Blevins, 2000b). Interim non-earnings disclosures: (1) can add value related information and (2) may reduce the misunderstanding of earnings related information.

This study measures only those interim disclosures that are purely voluntary throughout the

entire research period. There are two reasons for this.

One, interim reports contain both required and voluntary disclosures. Schadewitz, Kanto, Kahra & Blevins (2000a) find that, in some cases, Finnish regulators' perceptions of items that should be disclosed clearly deviate from those that managers would report in a strictly voluntary environment. Regulators, for example, would require more disclosure of variables indicating: (1) business risk, (2) capital structure and (3) historic growth (Schadewitz & Blevins, 1997a). Managers, on the other hand, would pay more attention to: (1) the specific needs of their governance groups and (2) growth potential (Schadewitz & Blevins, 1998b). A cursory review indicates that international regulations are both time- and country-specific (*Miller European Accounting Guide,* 1995). Thus, the disclosure interests of management varies far less, both cross-sectionally and intertemporally, than do the respective interests of regulators.   Therefore, purely voluntary disclosures reflect generally prevailing relationships that exist, internationally.

A second reason to focus on purely voluntary disclosures is their value as signaling devices (Gonedes & Dopuch, 1988). It is likely that some of the voluntary part of any disclosure generally reflect: (1) management's reaction to mandatory disclosures, (2) management's expectations of subsequent disclosure requirements and (3) the information that management desires to communicate to investors. By focusing the research on the voluntary portion of the interim statements, these characteristics of disclosure can be addressed.

Cumulative abnormal returns regression

This portion of the research is fairly conventional. Abnormal returns for HEX listed firms over the period 1985-93 are employed to capture the investors' use of earnings disclosures. CARs serve as the dependent variable, with unexpected earnings (UEs) and a measure of stock return

variability, $\sigma_R s$, being the independent variables.

Equation (2) summarizes:

$$CAR\ (d1,\ d2)_{it} =\ \beta_0 + \beta_1\ UE_{it} + \beta_2\ \sigma_{Rit} + \varepsilon_{it} \tag{2}$$

where:

$CAR(d1, d2)_{it} =$ the cumulative abnormal return for stock i at event t, beginning on day *d1* and ending on day *d2*. The negative/positive sign for the day indicates that the observation day is before/after the event day,

β_0 = the collective intercept for all stocks sampled,

β_1 = the earnings response coefficient (*ERC)*, for all sampled unexpected earnings, *UE*,

UE_{it} = the unexpected earnings for stock i at event t,

β_2 = the regression coefficient of the standard deviation of all sampled share returns, σ_R, during the (-30,30) business day period around the interim announcement day,

σ_{Rit} = the unbiased standard deviation of the share return of stock i during the (-30,30) business day period around the interim announcement day, t, and

ε_{it} = the normally and independently distributed errors for stock i at event t, using this model.

Dependent Variable: CAR(d1, d2)$_{it}$ --The computation of the CAR(d1, d2)$_{it}$ is initially performed through the standard multi-stage process. The abnormal return, AR$_{it}$, is defined as the difference between the realized return, RR$_{it}$, and the forecast return, FR$_{it}$, giving AR$_{it}$ = RR$_{it}$ - FR$_{it}$. The forecast return, FR$_{it}$ is market model determined. CAR(d1, d2)$_{it}$ is the cumulative summation of all AR$_t$s for security i over the period d1 through d2 (Foster, 1986).

β$_0$--The intercept captures the influence of every patterned factor that influences CAR that is left out of the model. Such factors include: (1) expected earnings, (2) quantitative non-earnings information and (3) qualitative non-earnings information. For the HEX, this coefficient is found to be insignificant or to be randomly significant pre-interim announcement and significant post-interim announcement. The post-interim announcement intercepts are also found to differ as a result of differing degrees of voluntary interim disclosure (Schadewitz, Kanto, Kahra & Blevins, 2001). This

research investigates the intercept in the very short window the day before to five days after the announcement.

β_1--Before the interim statement announcement, the market is compelled to use less-than-accurate information to make judgments about the stock's value. This is because of the dearth of pre-announcement information leakage associated with stocks listed exclusively on the HEX. The pre-announcement time in the vicinity of the event may be called the *pre-event anticipation period*. In such venues as the HEX, little pre-event activity occurs, so the β_1 coefficients for the HEX are mostly insignifiacnt. However, after the publication of interim statements, the investors in such an emerging market respond to the new information disclosed in the announcement. This response portion of time, after the event may be called the *post-event association period*. It is found that the post-announcement drift is significant and differs as a function of the degree of voluntary disclosure Schadewitz, Kanto, Kahra & Blevins (2001). This research attempts to add precision to that knowledge by discovering whether or not a short-term pattern exists.

UE_{it}--Previous research shows that separate interim income statement components contain incremental information (Hopwood & McKeown, 1985). Furthermore, Kormendi & Lipe (1987) propose that the impact of current earnings on stock price varies according to the magnitude of earnings persistence. An "earnings before extraordinary items" component, representing *permanent* earnings, is a standard measure used in the computation of EPS figures. Schadewitz (1996) indicates that the earnings component *before* extraordinary items contains more information to the market than does the earnings component *including* extraordinary items. Those results show that extraordinary items, representing transitory earnings, cause distortions in the overall earnings measurement.

Therefore, *permanent* earnings convey more systematic and useful information to the markets than do overall earnings.

An empirical counterpart for the theoretically defined permanent earnings is "earnings before extraordinary items" (Schadewitz & Blevins, 1998b). On 1 January 1986, the HEX began requiring a minimum of three items to be reported in interim statements The HSE Cooperative, 1988, 1990). One of the required interim entries is entitled "result after financial items." In the regressions, this unexpected form of permanent earnings is applied. A comparable standard entry for a firm chartered in the U.S. does not exist (Schadewitz & Blevins, 1997b).

Further, unexpected earnings are appropriately scaled. The numerator provides seasonal control of the permanent UE. The denominator normalizes the observation. Equation (3) summarizes the UE_{it} derivation:

$$
\begin{aligned}
&\textbf{[}(\textit{result after financial items} \text{ for firm } i \text{ in interim reporting period } \tau) \\
&\textbf{-} \quad (\textit{result after financial items} \text{ for the same firm in the corresponding} \\
&\qquad \text{interim reporting period } \tau\text{-}1)\textbf{]} \, / \\
&\qquad \text{Market value of equity at the beginning of interim reporting period } \tau. \qquad (3)
\end{aligned}
$$

This construction assures cross-sectional comparability of the UE figures [Christie 1987].

Equation (2) is a naïve model, assuming that the past will be replicated in the future. In practice, the market anticipates some value for the security based on adaptive, rational or some other expectation. Thus, the second element of the numerator should be "**expected** *result after financial items* for the same firm for reporting period τ." Unfortunately, no measure of investor expectation is available for most HEX listed firms (Schadewitz & Vieru, 1993). Therefore, any attempt by the authors to construct a measure of expectation would introduce unknown bias. This makes the naïve model the best available for the HEX.

β_2--The publication of an interim statement affects the degree of information asymmetry (Schadewitz & Blevins, 1998b). This difference is reflected as a dissimilarity in the dispersion of pre- and post-announcement share returns. The pre-announcement anticipation and the post-announcement association between stock price returns and the dispersion of the value of each return can be examined by regressing the standard deviation of stock returns, σ_{Rit}s, with contemporaneous stock market data, CAR_{it}. Differences in the σ_{Rit} coefficients, β_2, provide a measure of the change in information asymmetry extant before and after the announcement. It is found that information asymmetry is most reduced after the new information is assimilated into the market price Schadewitz, Kanto, Kahra & Blevins (2001). This research focuses on the timing of that assimilation.

σ_{Rit}--The σ_{Rit} variable is a measure of share specific risk (Greenstein & Sami, 1994; Singhvi, 1968). In this study, σ_{Rit}, is defined as the unbiased estimate of the standard deviation of the return of security *i* at event *t* over the time period 30 business days before the announcement of the interim report to 30 business days after the announcement date. This variable is intended to reduce the noise level in the data observed.

Degree of disclosure partitions

The degree of unexpected purely voluntary disclosure (UPVD) is used as a classification device (Neter, Wasserman & Kutner, 1990). This is accomplished by developing a composite UPVD forecasting model. The results of the UPVD forecasting model are used to partition the sample data into one of three levels of disclosure: (1) less-than expected, (2) about-as expected and

(3) greater-than expected. This treatment allows the use of standard statistical methodology to assess the differences in earning/price by disclosure class the day before through five days after an interim earnings announcement.

Emerging markets seldom have Association for Investment Management and Research (AIMR) type indices available. In their absence, such indices must be developed by the researchers. In this study, a disclosure index is prepared directly from the original interim reports. This avoids the criticism leveled at AIMR type disclosure indices, which are constructed from abstracts (Lang & Lundholm, 1993; Sengupta, 1998).

The empirical tests in this research are performed separately for: (1) three disclosure levels, which provide a quantity measure and (2) seven return accumulation periods, which provide a time dimension. Consequently, this research offers relatively thorough information about the speed and precision with which this emerging market assimilates voluntary interim information within the period one day before to five days after an interim earnings announcement.

In this research, unexpected disclosure, $UPVD_{it}$, is defined as the difference between the realized, $RPVD_{it}$, and the forecast, $FPVD_{it}$, levels of purely voluntary disclosure for firm i in interim reporting period t: $UPVD_{it} = RPVD_{it} - FPVD_{it}$. The forecast, $FPVD_{it}$, is the simple average of the results obtained from two forecasting models. One is random-walk based, while the other is disclosure-determinants based. Both forecasting models are briefly described below.

A combined model, comprising a random walk component and a determinants component, is applied. In the multiple regression models, the final combination of independent variables is based on backward elimination (Draper & Smith, 1981). The optimal model yields a 49/51 weighting. Because equal weighting (50/50) is intuitively more appealing, it is employed in the final disclosure forecasting model.

After the $UPVD_{it}$ values are computed, they are subdivided. This classification of disclosure is carried out by ranking the $UPVD_{it}$ values from lowest to highest and then dividing the $UPVD_{it}$ values into four equal parts. This regime allows regressions to be performed separately for each disclosure class.

Random-walk forecast--The random-walk based regression is a standard application. The observation for any examination period becomes the forecast for the next period. It is included because of its ability to capture the incremental significance of the difference between successive interim reports. In addition, the random walk model should also realistically resemble an actual comparison of information in two consecutive interim reports.

Disclosure-determinants forecast--The determinants forecasting model is an innovation, designed to include non-earnings data in this research. It does this by capturing the expected level of voluntary interim disclosure (Schadewitz & Blevins, 1997a).

A disclosure scoresheet is designed to identify those purely voluntary entries that are available to users of interim reports submitted to the HEX. Table 1 displays a summary of: (1) the instrument used in the primary data collection and (2) a listing of the possible responses used in the development of $UPVD_{it}$.

[Table 1 goes about here]

The independent variables are developed from a perusal of the literature (Schadewitz & Blevins, 1997a, 1997c) . These are summarized in the function, listed here as equation (3):

$$DIS = f(\text{governance, business risk, financial risk, capital structure,}$$
$$\text{stock valuation, growth, growth potential, size, market maturity)} \qquad (3)$$

Where: DIS = the dependent variable: disclosure index score.

Periods of Examination--Schadewitz, Kanto, Kahra & Blevins (1999) use a 61 day return period to confirm that CAR is associated with: (1) unexpected earnings and (2) the degree of disclosure. Yet, 61 day return accumulation windows are too long to capture the potential short-term market anomalies reported in previous literature (Bernard & Thomas,1989, 1990; Martikainen, Yli-Olli & Gunasekaran, 1991]. Because the anomaly typically occurs very near the event, there is a need to shorten the accumulation periods in order to capture the implications caused by the event itself. Accordingly, five day accumulation blocks are used in the follow-up study (Schadewitz, Kanto, Kahra & Blevins, 2001). A 41 day period, beginning 20 days before the announcement and ending 20 days after the announcement, reveals additional information. There is a pattern of share price adjustment to interim earnings releases. The entire cycle may be stated as: (1) anticipation, (2) event, (3) reaction, (4) adjustment, (5) association and (6) transition. That study also demonstrates the impact of varying levels of disclosure on share prices. However, even shorter windows are necessary to give further definition to these relationships. This research focuses entirely on the period beginning the day before the earnings announcement and ending first five days afterward. There are a total of seven periods examined.

IV. DATA

This section is included because research into emerging markets requires substantially more primary data collection than do those studies involving mature markets. Even the secondary sources for this market are unfamiliar to most readers.

The sample consists of all interim reports submitted to the HEX by non-insurance and non-

16

financial institutions sector firms over the period 1985-93. Finance and insurance sector firms are excluded due to their extreme variability: (1) cross-sectionally and (2) intertemporally (Niskanen, 1990).

CAR regression—the dependent variable data

CAR_{it}s are summations of AR_{it}s. The AR_{it}s used in this study are market- and risk-adjusted returns (Fama, 1976). The main sources utilized in the creation of the AR_{it}s are: (1) daily HEX stock return index files, (2) various market value databases, (3) annual reports of the Helsinki Exchanges, (4) financial statements of HEX listed firms and (5) *Kauppalehti* (a Finnish daily financial newspaper, similar to the U.S. *Wall Street Journal*).

Daily stock market data are available at the Helsinki School of Economics and Business Administration. HEX sample stock prices are collected and adjusted to provide the measure of *actual return*. Specifically, 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. Where more than one share series is traded, the more actively traded share series is applied. This series is very often also the main share series of the company and has the longest trading history in the firm.

The *market return* is a value-weighted market index, similar to that presented by Berglund, Wahlroos & Grandell (1983). No single market index spans the sampling period, so several market indices are used. Scaling factors are constructed make the series' compatible. A scaling factor is the ratio between the stock-specific indices in two databases. The index values for the scaling factor computations are based on a day when the bid and ask quotations match. This

procedure is commonly applied in studies of Finnish stock market data (Kmenta, 1986; Berglund, Liljeblom & Loflund, 1989; Martikainen, 1990).

CAR regression—the independent variables data

Measures of UE_{it} are based on originally pronounced interim reports covering the time period 1985-93. All interim reports published by firms listed on the Helsinki Exchanges during that period are used, with the exception of firms from the finance and insurance sectors. These are excluded due to their variability: (1) cross-sectionally and (2) intertemporally. A similar exclusion practice is followed by Niskanen (1990). This procedure yields 573 interim reports.

Disclosure index score

This research uses original data to construct its indices. This avoids the criticism leveled at AIMR type disclosure indices, which are constructed from abstracts (Lang & Lundholm, 1993; Sengupta, 1998).

The scoresheet is developed by systematically listing the elements found in the interim financial statements submitted to the HEX over the period 1 January 1985 through 31 December 1993. The total number of interim reports for which scoresheets are completed is 573. The number of interim report indices finally used as the dependent variable is diminished to 256. There are two reasons for this. First, that at least one of the independent variable observations is unavailable for 314 interim reports. Second, three interim reports are excluded as outliers, due to their extreme values. Precise definition of the event announcement date is always critical to an event study (Brown & Warner, 1985). In this research, the event day is determined by applying multiple, independent data sources. Some interim reports, or their cover letters, state the date the firm

officially announces the report. In those cases, the official announcement day is used as the event day. Failing that, the primary source of event times is the date that interim financial statements are registered as received at the HEX. The HEX has some interim reporting material on file for the year 1985. This information is, however, so limited that *Kauppalehti* newspapers are systematically used to supplement the files.

An *a priori* assumption is that managers temper their degree of disclosure by the type of the information to be revealed. One, firms with unexpectedly favorable earnings might be expected to increase their level of disclosure to expound on the high level of competence exhibited by that management group. Two, firms that are facing difficulty might be expected to expand their level of disclosure in order to explain the reasons for the poor performance (Skinner, 1994; Schadewitz, Kanto, Kahra & Blevins, 2000a). As a result, a potential relationship between UE and UPVD exists. A cross-tabulation between UE and UPVD is presented as table 2. The revealed relationship is so slight that it is ignored in subsequent calculations.

[Table 2 goes about here]

Partition of CAR by disclosure index

A disclosure classification is created by dividing unexpected disclosure into quartiles. The *F* test discloses that the two middle quartiles do not differ essentially from each other, so they are pooled. This leaves three expected purely voluntary disclosure classes. These are the: (1) *lower quartile*, which is the first fourth of the ranked $UPVD_{it}$s (n = 64), (2) *middle quartiles*, which comprise the middle half of the $UPVD_{it}$ observations (n = 128) and (3) *upper quartile*, which is the highest fourth of the disclosures observed (n = 63/64).

IV. RESULTS

Table 3 displays the regression results with the levels of unexpected disclosure in the columns and the periods examined along the rows.

[Table 3 goes about here]

Ball (1992) presumes that the post-earnings announcement drift differs by the level of disclosure. This is confirmed in Schadewitz, Kanto, Kahra, & Blevins (1999, 2001) and is further refined here. When the level of disclosure is approximately-as the market expects, this reaction/adjustment/association cycle begins the day of the announcement. When the level of disclosure is lower-than expected, the process begins one day late. Greater-than expected disclosure causes the adjustment process to be delayed by three days.

The Day before the Announcement

No statistically significant results for the model or for any of the individual coefficients are found for day (-1, -1) in any of the disclosure quartiles. This demonstrates that, even one day before the event, the markets have not fully anticipated the information content of the interim report.

The Day of the Announcement

When disclosures are about as expected, the market has a significant reaction to the unexpected earnings on the announcement day (0, 0). Also the model as a whole is statistically significant according the adjusted R^2. No other significance is found on the day of the event. This

demonstrates that the level of disclosure is a critical element in the communication with investors. This conclusion is further confirmed by recalling that no statistically significant results for the model or for any of the individual coefficients are found the day before the announcement in any of the disclosure quartiles. The contrast between the (-1, -1) and the (0, 0) windows indicates the importance of interim reports to the market. Regarding the reliability of data, this outcome gives additional evidence that the event days used in this study are precisely defined.

The Reaction Period: the Five Days after the Announcement

The association between returns and earnings is evidenced in the (0, 5) day sequence of the Schadewitz, Kanto, Kahra, & Blevins (2001) study. The examination periods of the earlier study, however, are too long to capture the timing of the onset of market response to varying levels of disclosure. In this research, the seven-day investigation period (-1, 5) is further shortened. This allows an investigation of the length of time it takes for the markets to react to the unexpected earnings/related disclosures.

Investor response is measured with the following cumulative windows: (-1,-1), (0, 0), (0, 1), (0, 2), (0, 3), (0, 4) and (0, 5). This is an attempt to capture the result of investor decision making, as value-determining evidence is assimilated by the market.

Disclosure About-as Expected--In the middle quartiles, the CAR/UE relationship is evident in each of the partitioned windows: (0, 0), (0, 1), (0, 2), (0, 3), (0, 4) and (0, 5). Yet, none is evident in the day before the interim earnings announcement (-1, -1). Because the Finnish market has access to such little pre-announcement information leakage, the market quickly reacts to the new information

when there are no surprises in the format of the presentation. The market seems to reward firms when the actual levels of interim disclosure closely correspond to the market's anticipations of the amount that will be disclosed.

The adjustment is not immediate: new information from the event is incrementally discounted into prices after the event. The magnitude of the β_1s increase from day 0 to day 2. The ERCs begin to decline after day 2. This indicates that the effect of UE on abnormal returns begins to slow as early as day 3. An exception is the accumulation period (0, 4), which displays an increase in the UE coefficient. No normative explanation for this departure exists. However, an empirical reason may be suggested by the fact that the data presented here are statistical estimates. The general magnitudes may provide accurate information about the trend of the CAR/UE relationship. The specific values of the β_1s, however, are simply point estimates representing a whole range of potential values the coefficient may in fact possess.

Disclosure Lower-than Expected-- Though not significant over most of the range, the pattern of β_1s displays a rapid rise to the peak, followed by a more gradual decline. This follows the pattern exhibited when disclosures are about-as expected. However, the market response to interim reports is *delayed* by *one day* when disclosure levels are lower-than expected. Both the onset of significance and the maximum significance are delayed by one day. The short lag may be due to market participants' search for additional information that was expected, but not provided in the interim statements. The lack of significance may indicate the market's contentment with the result of an additional search. This explanation is due, in part, to the fact that the firms that report in less-than expected magnitudes tend to be stable, when compared to their previous interim report. Penno (1996) calls this the *don't-rock-the-boat* disclosure policy. It creates some initial confusion among

market participants, but this seems to be relatively quickly resolved.

Disclosure Greater-than Expected--Statistical significance prominently appears in the upper quartile. In the upper quartile, the UE coefficient is first significant during the period (0, 3). This is *three days later* than it occurs in the middle quartiles. This suggests that the markets take longer to react to unexpectedly-high levels of disclosure than they take to react to expected levels of disclosure.

Although delayed by three days, the CAR adjustment to UE, given unexpectedly-high levels of disclosure, displays the same speed of adjustment pattern as that found in the middle quartiles. Significance is finally achieved on day 3. Days 4 and 5 experience a declining, though still significant, CAR/UE relationship. It should be observed that both the onset of significance and the maximum significance are delayed by three days.

Three explanations for the slowed market response in the upper quartile are offered. One, it is likely that an unexpectedly high degree of disclosure requires additional time and effort for market participants to make investment decisions. Two, it is possible 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 influence a firm's disclosure behavior. An example supporting this view is the fairly frequent reminder placed in interim reports warning that earnings figures are affected by seasonal variations. Analysis by the markets of the impact of such additional disclosures may postpone assimilation of the other interim data presented. Three, based on a thorough reading of all 573 interim reports comprising the sample, it may be concluded that unexpectedly high disclosure is most commonly associated with troubled firms. During difficult times, managers provide extended analyses of their firm's affairs. Such troubles

usually do not occur without generating some public notice. As a result, these difficulties are probably recognized by the market, even before the event. However, the market appears to withhold final judgment on the prospects of the firm until they have reviewed the interim statement disclosures. This may help explain the lack of significance in the upper quartile before the event but significance, with a lag, after the event. This empirical verification is in line with Penno (1996), who calls this the *back-to-the-wall* disclosure policy.

Figure 1 depicts the significant reaction lags associated with all three disclosure groups. This figure illustrates the existence of market inefficiencies and the impact of disclosure levels in their mitigation. There are very important management disclosure policy implications pictured here.

[Figure 1 goes about here]

All six examination windows are significant in the about-as-expected disclosure group. The initial reaction ERC of .608 on the announcement date (0, 0) is lower than the justified ERC value of 1.061, which is found during the association period (16, 20) in the earlier work by Schadewitz, Kanto, Kahra, & Blevins (2001). This confirms the Daniel, Hirshleifer, & Subrahmanyam (1998) theoy that investors *underreact* to public information. The next four days of the reaction period, however, (0,1), (0,2), (0,3) and (0,4) the ERCs rise above, even substantially above, justifiable levels. This finding confirms the earlier work by DeBondt, & Thaler (1985), who argue that markets initially *overreact* to new information. This article explains that both prior studies are valid. Both Daniel, Hirshleifer, & Subrahmanyam (1998) and DeBondt, & Thaler (1985) take a correct cross-sectional view of a response pattern at different points in that pattern. This article, by contrast, views the pattern in its intertemporal dimension. This research also discloses that one of the reasons for the

fluid adjustment process is the varying levels of disclosure with which the investors must contend.

V. SUMMARY AND CONCLUSIONS

Existing earnings/price literature discloses three salient points. One, reported earnings convey only partially relevant information in the determination of share prices. Two, even that portion of earnings information that is impounded in price is delayed. Three, markets temporarily misunderstand value measuring earnings signals. Interim reports help reduce the information asymmetry that is one major cause of these three inefficiencies. Non-earnings disclosures also enhance the market's ability to properly value the firm's shares. This research addresses the speed of adjustment of the market's response to varying levels of interim disclosures on the day of an interim earnings announcement and the five days thereafter. Unexpected earnings and the standard deviation of share returns are regressed against cumulative abnormal returns for each of three levels of disclosure. The three classes of disclosure are: (1) lower-than expected, (2) about-as expected and (3) higher-than expected.

It is discovered that, when subsequent disclosure is about-as-expected, the Finnish market reacts on the day of the interim announcement and achieves its maximum degree of reaction two days after the announcement. The reaction then slows over the next few days. Earlier research shows the market's adjustment to the initial over- or under-reaction is completed within ten days after the announcement. The association period then follows.

When the level of disclosure is lower than expected, this whole process is delayed by *one day*. When the level of disclosure is greater-than-expected, the process is delayed by *three days*.

Although these findings are time- and country-specific, it is expected that very similar patterns can be identified in other markets. The magnitudes and durations of adjustment lags can be expected to vary. In thinner markets, or markets with less technologically advanced trading, the reaction would be expected to be greater and to last longer. In more mature markets, the reactions would be expected to be smaller and of shorter duration. The level of disclosure/adjustment lag cycle, however, may well be observable in all markets. Worldwide, lower-than-expected levels of disclosure should delay investor response a little beyond that required for expected levels of disclosure. Investors' reaction to greater-than-expected levels of disclosure should take a bit longer than that required for either alternative disclosure quantity.

Subsequent research is recommended to confirm the findings reported in this particular emerging stock market. A related question that succeeding research might address is the relative information content of interim non-earnings disclosures. This study focuses on the existence and magnitude of disclosed interim items. The relative importance of any individual element is *not* treated. Such inquiry is a logical extension of this study. It might address the market's perception of the value of individual elements disclosed in interim reports. The items contained in the disclosure index are potentially productive for continuing investigation of the relative information content of interim reports.

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28

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Table 1. Summary of the Disclosure Scoresheet Used as the Basis for the Measurement of the Dependent Variable

A. MANAGEMENT REPORT

A.1. Management overview

1. Review of operations for the reporting period   (possible responses: 0.0/0.5/1.0)
2. Competitive position and market share   (possible responses: 0.0/0.5/1.0)
3. Earnings per share (EPS)   (possible responses: 0.0/0.5/1.0)
4. Figures for employees   (possible responses: 0.0/1.0)
5. Subsequent events   (possible responses: 0.0/0.5/1.0)
6. Outlook for the remainder of the operating year   (possible responses: 0.0/0.5/1.0)

A.2. Investments and finance

7. Presentation of anticipated investments   (possible responses: 0.0/0.5/1.0)
8. Management discussion of financial position   (possible responses: 0.0/0.5/1.0)
9. Presentation of anticipated capital structure   (possible responses: 0.0/0.5/1.0)

B. INFORMATION IN FINANCIAL STATEMENTS

B.1. Information in general

10. Applied accounting standards   (possible responses: 0.0/0.5/1.0)
11. Income statement   (possible responses: 0.0/0.5/1.0)
12. Balance sheet   (possible responses: 0.0/0.5/1.0)

B.2. Business segment information

13. Breakdown of turnover or net sales by business segment (possible responses: X/0.0/0.5/1.0)
14. Breakdown of income by business segment   (possible responses: X/0.0/0.5/1.0)

B.3. Geographical information

15. Breakdown of turnover or net sales by geographical area (possible responses: X/0.0/0.5/1.0)
16. Breakdown of income by geographical area   (possible responses: X/0.0/0.5/1.0)

III. B.4. Disclosure and analysis of components related to financial statements

17. Turnover or net   (possible responses: 0.0/0.5/1.0)
18. Research and development (R&D)   (possible responses: 0.0/0.5/1.0)
19. Depreciations of property, plant and equipment   (possible responses: 0.0/0.5/1.0)
20. Result after financing items   (possible responses: 0.0/0.5/1.0)
21. Other income and expenses   (possible responses: X/0.0/0.5/1.0)
22. Result before appropriations and taxes   (possible responses: 0.0/0.5/1.0)
23. Inventories and their valuation   (possible responses: 0.0/0.5/1.0)
24. Orders logged and the order backlog   (possible responses: 0.0/0.5/1.0)
25. Leasing contracts   (possible responses: 0.0/0.5/1.0)
26. Commitments and contingencies   (possible responses: 0.0/0.5/1.0)

Table 2. Cross-Tabulation of Unexpected Purely Voluntary Disclosure (UPVD) and Unexpected Earnings (UE)

Unexpected Earnings (UE) quartile	Unexpected Purely Voluntary Disclosure (UPVD) quartile				Total
	First	Second	Third	Fourth	
First					
Frequency	15	15	18	15	63
Row percentage	23.81	23.81	28.57	23.81	100.00
Second					
frequency	25	17	14	8	64
row percentage	39.06	26.56	21.88	12.50	100.00
Third					
frequency	14	13	17	20	64
row percentage	21.88	20.31	26.56	31.25	100.00
Fourth					
frequency	10	19	14	21	64
row percentage	15.63	29.69	21.88	32.81	100.00
Total					
frequency	64	64	63	64	255
percentage	25.10	25.10	24.71	25.10	100.00

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

Table 3. Unexpected Earnings and Return Variability on CAR, by Varying Levels of Disclosure

CAR	Lower quartile [1] $UPVD < -.04212$				Middle quartiles [2] $-.04212 \leq UPVD < .04460$				Upper quartile $.04460 \leq UPVD$			
D1, d2	β_0	β_1	β_2	AdjR^2	β_0	β_1	β_2	AdjR^2	β_0	β_1	β_2	AdjR^2
Pre-Event: Anticipation Window												
The day before the Event												
-1, -1	.196	.042	-.147	-.024	.332	-.100	-.187	.001	.402	-.019	-.231	-.014
Event Day												
0, 0	-.461	.341	.123	.037	-.155	**.608**	.127	**.051**	.361	- .140	- .383[3]	-.013
Post-Event: Association Window												
Reaction Period												
0, 1	.107	**.481**	- .662	**.156**	.611	**_1.648_**	-.478	**_.179_**	.617	.233	-1.070[3]	**.068**
0, 2	-.565	.130	- .488	-.016	.834	**_1.909_**	-.327	**_.172_**	.592	.372	- .740[3]	.062
0, 3	-.366	.103	- .182	-.028	**1.296**	**_1.478_**	-.758	**_.126_**	.672	**_1.461_**	**-1.570[3]**	**_.379_**
0, 4	-.305	-.051	-1.007	-.012	**1.253**	**_1.673_**	-.563	**_.131_**	.691	**1.145**	-1.024[3]	**_.201_**
0, 5	-.159	.124	- .419	-.022	.944	**1.067**	-.423	**.043**	.175	**.897**	- .717[3]	**.125**

[1] n = 64; [2] n = 127; [3] n = 63; **significance below .05**; **_significance below .001_**   Where: CAR (d1, d2)$_{it}$ = $\beta_0 + \beta_1 UE_{it} + \beta_2 \sigma_{Rit} + e_{it}$

CAR(d1, d2)   = Cumulative abnormal returns starting from a beginning day of the interim reporting period *d1* and ending on day *d2*. The negative/positive sign for the day indicates before/after the event day.

β_0 = The intercept. β_1 = Unexpected earnings response coefficient.

β_2 = The standard deviation of returns during the 61 business days (-30, 30).

Appendix 2. Purely Voluntary Disclosure Forecasting Model
Dependent Variable: Disclosure Index Score

Independent Variables	Parameter Estimate	Standard Error	t value	Level of Significance
Governance:				
LnShs	.01183	.00510	2.321	.020
Firms	-.00057	.00026	-2.165	.050
Business Risk:				
$\sigma\%\delta NS$	.08694	.04652	1.869	.100
$\sigma(\delta FA/A)$	.00271	.00096	2.822	.010
Financial Risk:				
β	-.01390	.01928	- .721	
Capital Structure:				
L/E	.00332	.00342	.970	
Stock Valuation:				
PostCAR	-.00200	.02068	- .090	
Growth:				
$\delta FA/A$	.00061	.00058	1.041	
Growth Potential:				
P/NS	-.39024	.11222	-3.478	.001
Size:				
LnWorker	.02877	.00579	4.968	.001
Market Maturity:				
CY_{85}	-.10988	.06077	-1.808	.100
CY_{86}	-.05842	.05730	-1.019	
CY_{87}	-.04372	.05802	- .754	
CY_{88}	-.00722	.05946	- .121	
CY_{89}	.01802	.05865	.307	
CY_{90}	.00633	.05717	.111	
CY_{91}	.00025	.05579	.005	
CY_{92}	-.01808	.05773	- .313	

lnShs = The natural logarithm of the number of shareholders,
Firms = The percentage of corporate ownership,
$\sigma\%\delta NS$ = The standard deviation of the percentage change in net sales,
$\sigma(\delta FA/A)$ = The standard deviation of the net investments (change in fixed assets)/total assets ratio,
β = The market model beta,
L/E = The debt/equity ratio,
PostCAR = The market model adjusted post-event cumulative abnormal return (CAR),
$\delta FA/A$ = The net investments (change in fixed assets)/total assets ratio,
P/NS = The profit/net sales ratio,
lnWorker = The natural logarithm of the number of personnel, and
$CY_{85},...,CY_{92}$ = Yearly dichotomy variables.