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THE RELATIVE AND INCREMENTAL INFORMATION CONTENT OF CONSOLIDATED EARNINGS DATA

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I. *Introduction*

Despite the internationalization of securities markets, financial reporting standards and practices, which form the basis of the information flowing into securities markets, continue to vary from country to country. It is, however, an open issue as to how these differences in financial reporting are associated with stock price behavior in each country's capital market. Does the internationalization of securities markets neutralize the financial reporting differences, or do the financial reporting differences among countries generate differences in the way investors react to accounting information? This is an important issue in that solutions to the normative problem of international "harmonization" of accounting standards depends upon the results of empirical analyses which highlight the associations between accounting differences and stock market behavior from an international perspective.

Some in the financial community in the United States have pointed out the "abnormally" high price-to-earnings (P/E) ratios of stocks in Japan relative to those of the U.S. Prior to the stock market crash on October 19, 1987, the average P/E ratio of stocks listed in the Tokyo Stock Exchange (TSE) was more than 70 to 80 times via a vis an average ratio of 20 times for Dow Jones 30 Industrials in the U.S.[1] This difference in ratios should be analyzed from a variety of perspectives. Difference between U.S. and Japanese financial reporting systems provide one of the major explanatory variables available for analysis of this issue.

This study approaches the issue, recognizing that one of the principal differences in the mandated disclosure system between U.S. and Japan is the *coexistence* of separate and con-

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[1] On the last trading day in the month before the "crash" occurred, 89.66 was the average P/E ratio of 225 exchange-listed issues which constitute Tokyo Nikkei Average, while the average P/E ratio of Dow Jones 30 Industrials was 19.7 a week before the "crash." , This huge gap between them may justify the term "abnormal."

It is necessary, however, to note that the Japanese P/E ratios have always been at such relatively high levels. The average P/E ratio of issues which constitute the first section of TSE was 9.14 at the end of 1970, and 22.93 at the end of 1980. It reached 29.16 at the end of 1983, and 49.05 at the end of 1986. For comparison, the average P/E ratio of S&P 400 issues was 9.58 at the end of 1980, 12.60 at the end of 1983, and 18.70 at the end of 1986.

solidated financial reporting systems in the latter. In Japan, the Securities and Exchange Law has required corporations under its jurisdiction to prepare and disclose consolidated financial statements as supplementary documents to Form 10-K filed with the Ministry of Finance, in addition to the parent company's separate financial statements since the fiscal year starting after April 1, 1977.

The Japanese system, which provides for the disclosure of two sets of financial statements is basically different from the U.S. disclosure system, which requires public corporations to report only consolidated financial statements, with some exceptions. In addition, the Japanese Securities and Exchange Law stipulates that separate financial statements as primary documents should be field with the Ministry of Finance within three months, while consolidated financial statements must be filed within four months after the fiscal year.[2] It follows that there exists a timing difference in disclosure between the two sets of financial data.

Although the consolidating procedures followed by Japanese companies are basically the same as those by U.S. companies, there are several differences in specific procedures between them which are worth discussing. First, when the consolidated reporting system was mandated, application of the equity method was voluntary.[3] It was not until the fiscal year starting after April 1, 1983 that the Securities and Exchange Law required listed companies to apply the equity method to unconsolidated subsidiaries and investments of 20–50% of the outstanding shares of investees.[4] Unlike U.S. GAAP, however, Japanese regulations prohibit the use of the equity method for separate financial statements.

In Japan, a parent company in principle must consolidate all of its subsidiaries including finance subsidiaries.[5] In this regard, Japanese GAAP has adopted the same policy as the newly promulgated FASB Statement No. 94 which has settled the controversy as to whether to include heterogeneous subsidiaries such as finance companies.[6] As far as the scope of consolidation is concerned, there exists an important exception to the principle above. If exclusion of subsidiaries from consolidated financial statements would not preclude investors' reasonable judgement about the financial position and results of the group, those immaterial subsidiaries can be excluded from the consolidated financial statements. As for the specific guidelines for judgement of "immateriality," the Ministry of Finance indicated three tests depending on the item to be referred to: asset-test, sales-test and profit-test. Specifically, to the extent that the sum of each item for a subsidiary is less than 10% of the sum of the corresponding item for consolidated companies, such subsid-

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[2] The new rule was issued after the present study. It requires corprations to file their consolidated financial statements within three months after the fiscal year end. It has been effective since the fiscal year ending March 31, 1989.

[3] 14.3% of the companies which disclosed consolidated financial statements adopted the equity method in the fiscal year ending March before the equity method was mandated. Next year the ratio rose to 36.4% (see Ito and Uchida [1985]).

[4] For the impact of this regulatory mandate on the financial reporting system, see Ito and Uchida [1985].

[5] However, excluded from consolidated financial statements are the following cases where:

(1) the subsidiaries are no longer considered to be controlled by the parent, or
(2) the subsidiaries are not considered a going concern because of bankruptcy, liquidation and so on, or
(3) the parent company temporarily has the majority of voting rights in the subsidiaries, or
(4) Investors would be misled by the consolidation of such subsidiaries as are located in countries where the political situation is instable or foreign currency rates change radically.

[6] For the recent controversy, see Rue and Tosh [1987] and Mohr [1988].

iaries can be excluded from consolidated financial statements.[7] As far as the equity method is concerned, the judgement of immateriality is only based on profit-test.[8] Interperiod tax allocation is applicable only to consolidated financial reporting.

As many observe, the TSE and the NYSE (New York Stock Exchange) have become increasingly interrelated. Even though the interrelation was originally caused by macro-economic factors such as changes in oil prices and interest rates and increasing international trade, it is possible that stock price reactions based on the financial reporting system of one country more or less pervades those in the country through the loop of interrelationship. For example, stock price changes of individual U.S. firms based on quarterly disclosures in the U.S. may affect the stock price of Japanese firms in the same industry.

Although the "interpermeation" issue is interesting in its own right, there is little knowledge about the relationship between the differences in financial reporting system and stock market behavior in the U.S. and Japan. In the context of the paper, one issue to be addressed is which data, separate financial data or consolidated financial data, is more often relied upon in the Japanese stock market, assuming that the U.S. market relies upon consolidated financial data. Another issue is whether separate financial data has incremental information content beyond that contained in consolidated financial data.

The present study attempts to examine the relative anh incremental effects of consolidated earnings data on stock prices in Japan as compared with that of separate earnings data in Japan. It consists of three sets of analyses: the first two of them are primary and the last one is supplementary. The primary analyses employ cross-sectional analysis techniques, while the supplementary one is based on a time-series analysis. Abdelkhalik and Ajinkya [1979] point out the necessity of "triangulation" in evaluating research quality. "Triangulation" refers to the use of a multiplicity of methods and designs to study a given problem. The present study attempts to accomplish such "triangulation."

The paper is organized as follows: Section II considers the characteristics of consolidation and possible limitations of consolidation to the economic analysis of firms. Section III describes the underlying models and data common to all the analyses conducted here and develops testable hypotheses. Research designs of primary analyses are delineated in Section IV. Section V and VI provide findings and implications of the first and second analysis, respectively. Section VII conducts the supplementary analysis to reinforce the investigations of the first and second analyses. Concluding remarks are made in Section VIII.

II. *Consequences of the Mechanism of Consolidation*

The existing Japanese disclosure system seems to assume that consolidated financial

[7] The following data might be useful in understanding how this "immateriality" is material in Japanese consolidated financial reporting practice. 464 firms with March ending fiscal year disclosed their consolidated financial statements in 1986. Although those firms had 14,110 subsidiaries, only 4,203 of them (29.8 %) were consolidated subsidiaries. 99.2% of unconsolidated subsidiaries were attributable to the "immateriality" guideline (data provided by TSE). Similar trend was also found consistently in the past years (see Ito and Uchida [1985]).

[8] In the fiscal year ended March, 1986, more than half of the companies which disclosed consolidated financial statements applied the equity method. 92% of the companies which did not apply the equity method mentioned the "immateriality" guideline as the reason for exclusion.

reporting is useful for decision making by investors. Its usefulness however, is not self-evident. A couple of attempts have been made to examine its usefulness. Beranek [1987] and Beranek and Dillon [1982] demonstrate difficiencies in evaluating financial risk on the basis of consolidated data. While they point out that consolidated financial statements would lead to overestimation of financial risk of the parent company, Rue and Tosh [1987] and Mohr [1988] maintain that existing consolidated financial statements, which exclude finance companies, cause the debt-to-equity ratio of the parent company to be considerably lower than it would be otherwise. Whittred [1987] argues that contracting practices designed to minimize agency costs played an important role in the evolution of consolidated financial reporting in Australia, and the likelihood of consolidation is a function of the presence of cross-guarantees, management's share of a firm's equity and the number and type of subsidiaries.

One of the major objectives of consolidated financuial reporting is to make sure that companies present fairly the financial conditions and results of a group which comprises of a parent company and subsidiaries (and affiliated companies), disregarding the legal boundaries of companies. One of the differences between separate and consolidated financial statements lies in the accounting entity being reported. Consolidated financial statements are not simple aggregations of separate financial data. In consolidation, revenues and expenses (and profit) attributable to transactions within group companies are excluded from consolidated financial statements. To put it differently, "non-arm's length" transactions or transactions controlled by mechanism other than the "market" mechanism are not reflected in consolidated financial statements.

It is difficult, however, to identify the economic consequences of such consolidating procedure. "New institutional economics" proposed by Williamson and other economists may be useful in considering those consequences. They maintain that decisions regarding "governance" of transactions or integrations (or "the size of firm") are based upon considerations of transaction costs (or the sum of transaction costs and production costs). In other words, firms decide their economic behavior so as to minimize those costs.

Williamson [1979, 1985] argues that there are four types of governance of transactions according to the level of frequency and idiosyncrasy (transaction-specific investment) of transactions: market governance, bilateral governance, trilateral governance and unified governance. Unified governance means to integrate another company and place it under uniform ownership. Accounting entities consolidated are basically those integrated companies. Consolidating procedures require offsetting sales of one company and costs of sales of another company within a group. The procedures prevent companies from reflecting of such transaction cost minimizing behavior.

In preparing consolidated financial statements, the application of the equity method is required both in the U.S. and Japan in cases where one company, A, owns more than 20 % of the outstanding shares of another company, B. Under equity method, the same procedure of offsetting profit as that in the case of parent-subsidiary relationship is applied in proportion to the ownership percentage. In such transactions between A and B, however, there are many cases where the transactions should be deemed arm's length transactions, that is, unilateral (or trilateral) governance, rather than unified governance administers the transactions. In those transactions, it is the critical point how to optimally negotiate each other in terms of transaction costs, which modern economics has recently

made efforts to analyse in a positive manner (for example, see Masten and Crocker [1985] and Crocker and Masten [1987]). However, consolidated statements using the equity method do not reflect the performance of such negotiations or contracts critical to transacting parties.[9]

On the other hand, consolidated financial reporting system exerts strong power in excluding profit manipulation behavior of firms through group companies which does not necessarily aim at minimizing transaction costs. It would be useful in reducing the possibility of being misled by manipulated statements based on firms' irrational behavior. It would be difficult, however, to draw a line between rational and irrational behavior.

Furthermore, researchers still do not know how consolidated earnings are associated with the dividend paying ability of parent company. The value of firm is said to be determined by the future flow of dividends. In Japan the Corporation Law requires companies to calculate the earnings available for dividends using companies' own separate financial statements only (Section 293). The Japanese Corporation Law (which is distinct from the Japanese securities regulations) does not require even large corporations to prepare consolidated financial statements.[10] On the contrary, for example, California Corporation Code stipulates that corporations calculate the funds available for distributions based on their consolidated financial statements (Sections 114 and 500).

III. *Underlying Models, Data and Hypotheses Development*

Sample and Data

The sample analyzed here in all the analyses is comprised of all corporations whose shares are listed in the first section of the TSE and fiscal year is from April 1 to March 31. The first reason the sample was restricted to these firms is that the first section of the TSE is the most active in terms of trading volume. The second is that the firms which adopt a fiscal year ending in March constitute the largest portion of corporations listed on the TSE.[11] However, the exclusion of firms whose stocks are rarely traded led to 234 firms as the final sample.

This study employs ordinary income numbers (net income before extraordinary items) for both parent company's separate income numbers (*SIN*) and consolidated income numbers (*CIN*). These income data (and other financial statement data included in each company's 10-K filed with the Ministry of Finance) are on the Financial Data Base developed by the Japan Development Bank, which is one of Japan's major financial data bases.

Rates of security returns for corporations listed on the TSE are published monthly by the Japanese Securities Research Institute. The Institute makes these returns available to the public in the form of a data base, which the current study uses.

The research is conducted using these income numbers and security returns data for a period from 1978–1986, except for the calculation of market β.

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[9] For the recent innovative application of transaction cost economics to accounting, see Lev [1988].

[10] Itami and Ito [1982] make a comprehensive comparison of financial reporting standards in the U.S. and Japan, and probe the causes for the differences in standards in terms of three dimensions: capital market, legal system and management behavior.

[11] Of 300 sample firms by Japanese Accounting Techniques and Reporting [1988], 64% adopt the fiscal year ending March. The second common fiscal year end is November (10%), and December the third (8%).

Hypotheses

Given that two sets of financial statements (esp. *SIN* and *CIN*) of a parent company and its group companies are available to investors, how is that accounting data used by investors in making investment decisions? Although there are conceivably many patterns that could be followed by investors regarding how to incorporate the information of *SIN* and *CIN* in decision making, three typical patterns in terms of mixture of weight given to each of *SIN* and *CIN* can be identified:

Pattern I—Investors give more weight to *SIN* (i.e., less weight to *CIN*)
Pattern II—Investors give more weight to *CIN* (i.e., less weight to *SIN*)
Pattern III—Investors give equal weight to each of *SIN* and *CIN*

The same patterns could apply to market reactions which are the aggregated version of individual (including institutional) investors decision making.

Therefore, one of the purposes of the primary investigation is to examine which of these three patterns is relatively dominant in market reactions using a cross-sectional analysis. Statistically, this first investigation attempts to test the following null and alternative hypotheses:

H_{N1}: Investors give equal weight to each of *SIN* and *CIN*.
H_{A1}: Investors give more or less weight to *SIN* than *CIN*.

This test examines the *relative* association between investors and market reaction and changes in two earnings variables. To put it differently, it tries to identify the *average* difference in influences on stock prices of changes in *SIN* and *CIN* (firm specific residual stock price changes).

The next analytical step is to identify the "incremental" or *marginal* difference in information content between the two earnings variables. This means to test the additional explanatory power of one earnings variable given the knowledge of the other earnings variable. Taking into account the institutional history of mandating consolidated financial reporting system in Japan (separate financial statement data have been publicly disclosed for many years, whilst later and in addition, consolidated financial statement data have been required to be provided), it may be natural to test the following null and alternative hypotheses:

H_{N2}: *CIN* do not have incremental information content beyond that contained in *SIN*.
H_{A2}: *CIN* have incremental information content beyond that contained in *SIN*.

However, for the purpose of comparison between Japan and the U.S., where only consolidated information is disclosed, one could possibly test the reverse. The hypothesis would be as follows:

H_{N3}: *SIN* do not have incremental information content beyond that contained in *CIN*.
H_{A3}: *SIN* have incremental information content beyond that contained in *CIN*.

Underlying Models

The two primary and one supplementary analyses conducted below are based on a

couple of common models.

One must assume a specific earnings expectation model of investors to identify what is "good" or "bad" news. To date a number of expectation models have been indicated. In Japan, however, there have been few research examples that have attempted to test which expectation model has the most powerful explanatory ability in Japan's security market. For the purposes of this paper it will be assumed that the time-series of earnings (esp. ordinary income) follows a martingale process, which is well documented and widely accepted in the U.S. (e.g. Ball and Brown [1968], Ball and Watts [1972], Brooks and Buckmaster [1980] and Foster [1986]).

The model is shown as follows:

$$OI_{it}=OI_{it-1}+\omega_{it}$$

$$E(OI_{it})=OI_{it-1}$$

where

OI_{it}=Ordinary income of firm i in year t

ω=error term

Therefore, if $(OI_{it}-OI_{it-1})>0$, it means "good" news, on the other hand, if $(OI_{it}-OI_{it-1})<0$, it means "bad" news, assuming the difference reflects permanent factors (Beaver and Morse [1978]).

In order to investigate relationships between the changes in *SIN* or *CIN* and investors and market reactions, I employ security returns as the measure of the latter. The market model is used to eliminate market-wide elements of security price changes as follows:

$$R_{it}=\alpha_i+\beta_i R_{mt}+e_{it}$$

where

R_{it}=Rate of security returns (percentage change in price including dividends) of firm i month t

R_{mt}=Rate of return in month t on a market portfolio of TSE common stocks

e_{it}=firm specific error term

α and β are calculated using return data during the period 1977 through 1985. The use of pre-1977 return data is risky due to the high probability of structual changes having occurred during the period. Based on the model above, unexpected security returns specific to the firm are defined as follows:

$$u_{it}=R_{it}-(\hat{\alpha}_i+\hat{\beta}_i R_{mt})$$

u_{it} also represents abnormal security returns. Summing these abnormal returns for a given months leads to *CAR* (Cumulative Abnormal Returns):

$$CAR_i=\sum_{t=1}^{t+\tau} u_{it}$$

IV. *Research Design*

Two primary analyses are conducted to examine the two null hypotheses, H_{N1} and H_{N2}. Those analyses have contrasting characteristics: (1) While the first principally focuses on the average difference in information content between *SIN* and *CIN*, the second examines the marginal difference. (2) The first uses only the signs of changes in two variables, whereas the second employs the magnitude as well as the signs. (3) The first primarily exploits nonparametric statistics, but the second parametric statistics.

These two analyses should not be deemed exclusive, but complementary to each other. Furthermore, one supplementary examination is made to reinforce the results of two primary researches.

Design of First Primary Analysis

The first primary research starts by classifying 234 sample firms into four categories according to the signs of changes, that is, unexpected increase (*UI*) and unexpected decrease (*UD*), in *SIN* and *CIN*. It results in:

Category A: *UI-SIN, UI-CIN*
Category B: *UI-SIN, UD-CIN*
Category C: *UD-SIN, UI-CIN*
Category D: *UD-SIN, UD-CIN*

Such classification is made year by year from 1979 to 1986. Although consolidated financial statement disclosures were required first in March 1978, focusing on earnings changes only makes the analysis possible from March 1979.

Each company's *CAR* is calculated monthly during the period from January to July each year. There are two reasons this period was selected. The first is related to the choice of last month to be examined. The Securities and Exchange Law in Japan requires companies under its jurisdiction to prepare and disclose consolidated financial statements as supplementary documents to the Form 10-K by 4 months after the end of fiscal year, whereas parent company's separate financial statements included in Form 10-K are required to be prepared and disclosed by 3 months after the end of fiscal year. Therefore, companies with fiscal year ending March are required to file their separate financial statements by the end of June, and consolidated financial statements by the end of July. In fact, primary data of consolidated financial statements are made public prior to their filing with the Ministry of Finance through their announcement at the TSE and in the Japan Economic Journal (the following day). Table 1 shows the distribution of days between the fiscal year end and the announcements of consolidated reports. As apparent from the Table, the announcements center in the period of 110 to 120 days which is the last week provided for by the law. In addition, Table 2 shows the average days between the fiscal year end and the announcements of separate reports and consolidated reports, respectively. Table 2 indicates that on average separate financial statement data are announced about two months after the fiscal year end, whereas consolidated financial statement data are announced three and a half months after the fiscal year end. Furthermore, the announcement timing virtually does not change across years both for separate and consolidated information.

TABLE 1.
Distribution of Intervening Days Between Fiscal Year End and Announcements of Consolidated Earnings (fiscal year ended March, 1986)

Days	~50	~60	~70	~80	~90	~100	~110	~120	~130
No. of Firms	3	17	5	10	60	29	79	216	45
Percentage	0.6	3.7	1.1	2.1	13.0	6.2	17.1	46.5	9.7

*Based on data provided by Tokyo Stock Exchange.

TABLE 2.
Trend of Average Intervening Days Between Fiscal Year End and Announcements of Separate Earnings and Consolidated Earnings (fiscal years ended March)

Fiscal Year	Separate Earnings (A)	Consolidated Earnings (B)	(B)−(A)
1978	57.4	108.8	51.4
1979	56.4	106.7	50.3
1980	55.6	105.9	50.3
1981	55.4	106.0	50.6
1982	54.9	105.2	50.3
1983	55.4	106.8	51.4
1984	55.3	107.2	51.9
1985	54.8	106.0	51.2
1986	54.5	105.5	51.0

*Sample firms are 464. Based on data provided by Tokyo Stock Exchange.

The second reason for using the January to July returns interval is related to the choice of the starting month. Many researchers have so far used the whole year as a target period. For instance, Ball and Brown [1968] define the month of the annual report announcement as 0 month and trace 12 months prior to the announcement. Beaver, Griffin and Landsman [1982] define security returns (R_{it}) on a December 31 to December 31 basis.[12] This might lead the present study to adopt the holding period on a July 31 to July 31 basis. As the results in Ball and Brown [1968] suggest,[13] however, the adoption of a 12 month-holding period would force R_{it} or CAR_{it} to include the information content of other events besides the announcement of annual earnings. To put it differently, adopting a July 31 to July 31 basis would make it impossible to untangle the information content of *annual* earnings from other intervening information such as interim earnings, interim dividends, analysts' forecasts and so on. The paper aims to compare the information content of *annual* separate earnings with that of annual consolidated earnings. Thus, it is required to control for

[12] Their analysis is based on firms with a December 31 fiscal year-end. In addition, they examined five alternative holding periods, starting January 1 through January 1 and ending with May 1 through May 1, considering the timing of disclosure of replacement cost data. Similar results to those based on a December 1 through December 1 holding period were obtained.

[13] According to the evidence provided by Ball and Brown [1968], much of the stock price reactions is found considerably prior to the announcement of annual earnings. The evidence is consistent with the interpretation that investors revise their expectation or belief based on intervening information such as quarterly earnings and analysts' forecasts.

the intervening information. That contains so diverse sets of information that it is unable to control all of them. It may not be, however, so difficult to control for the possible effects of interim earnings announcements. The Japanese disclosure system comprises semi-annual financial reporting as well as annual reporting. The Securities and Exchange Law stipulates that listed companies file their semi-annual financial statements *only on a separate basis* with the Ministry of Finance by nine months after the start of the fiscal year.[14] Based on this requirement, it may be reasonable to posit that the return implications of the semi-annual earnings of the companies with the fiscal year ending March are impounded in the stock prices by the end of December. Consequently, calculating R_{it} or CAR_{it} on a January through July basis may enable the examination to untangle the return implications of two different sets of separate earnings data.

As a next step, *CAR*s in each month from January to July are averaged by each category year by year:

$$CAR_i = \sum_{t=1}^{7} u_{it}$$

$$U_t^X = \frac{1}{n} \sum_{i=1}^{n} CAR_{it}$$

where

U_t^X=mean of *CAR*s of companies belonging to category X in month t
n=number of companies belonging to category X

*U*s in each category are shown in graphs monthly from January to July each year. The graphs, which provide the time-series behavior of *U*s in each category, may be useful in evaluating the order of each category's U levels as well as the changes in U over time. The behavior of U in each category can be predicted in relative terms corresponding with each of the three information processing patterns followed by investors described above, It is shown in Table 3.

Table 3 reveals that it is only in categories B and category C that different patterns of information process would result in different predictions of the behavior of U in relative terms. Thus, observing the behavior of category B and category C would make it possible

TABLE 3.
Predicted Behavior of Stock Prices in Relation to the Patterns of Information Processing Followed by Investors

	Category A	Category B	Category C	Category D
Pattern I	↗	→	↘	↘
Pattern II	↗	↘	↗	↘
Pattern III	↗	→	→	↘

[14] The computation of interim earnings in Japan is based on "integral theory" rather than "discrete theory." (For those opposing theories, see Foster [1986]).

to draw inferences regarding which pattern may be dominant. Identification of a significant difference between the means of populations of category B and category C, would allow the null hypothesis H_{N1} to be rejected.

Furthermore, it may contribute to testing the null hypotheses to compare the *CAR*s in each category. If one identifies a significant difference between the means of populations of category A and category B, H_{N2} could be rejected. For both categories have the same sign (positive) for *SIN* changes and a different sign for *CIN* changes. If no significant difference can be observed, *CIN* do not have any incremental information content. The relationship between category C and category D, both of which have the same sign for changes in *SIN*, is relevant for testing the null hypothesis H_{N3}. If a significant difference between the means of each population is found, H_{N3} can be rejected. It follows that *SIN* have incremental information content, given that *CIN* are provided.

In implementing tests, there might be doubts about the validity of the assumption of normally distributed population or the assumption of equal population variances in sample firms in each category. However, sample firms in each category could be deemed independent random samples. These restrictions led to employing the Mann-Whitney *U* test. Nevertheless, given the possibility that the assumptions described above are violated, a *t* test was conducted.

Design of Second Primary Analysis

The first primary analysis employs the combinations of signs in two earnings variables based on the dichotomy of "good" and "bad" news, ignoring the magnitude of unexpected earnings changes. On the other hand, the second primary analysis takes into consideration the magnitude as well as signs of the earnings changes.

The use of time-series analysis would be difficult in this case, due to the fact that only ten years have passed since the introduction of mandated consolidated financial reporting in Japan. Cross-sectional analysis has several merits (see Beaver, Griffin and Landsman [1982]), although the high level of correlation between *SIN* and *CIN* (See Table 8) gives rise to the problem of collinearity.

Thus, the current study employs the two-stage regression model adopted by Beaver, Griffin and Landsman [1982] and Beaver and Landsman [1983] to cope with the collinearity problem. Christie et al. [1984] point out that it is difficult to untangle the relative influences of the independent variables, since collinearity is inherently a data problem. Furthermore, they maintain that the two stage regression is not an efficient method, because a single multiple regression would suffice.

Nonetheless, this study is based on the two-stage regression model for the following reasons: (1) No alternative powerful model has been developed. (2) Even though the two-stage regression is not efficient, the choice between the two regression models is "one of form rather than substance" (Bernard and Ruland [1987]). (3) The findings appear to be so robust as to partially overcome the weakness of the two-stage regression.

The procedures for the two-stage regression are as follows:

First-stage regression

$$CIN_{it}=\alpha_t+\beta_t SIN_{it}+Z_{it}$$

where

CIN_{it}=percentage change in separate ordinary income of firm i in year t
SIN_{it}=percentage change in consolidated ordinary income firm i in year t
Z_{it}=a residual of *CIN* which is uncorrelated with *SIN*

Second-stage regression

$$CAR_{it}=\alpha_t+\beta_{1t}SIN_{it}+\beta_{2t}Z_{it}+\mu_{it}$$

where

$$CAR_{it}=\sum_{m=5}^{7} u_{im} \quad \text{of firm } i \text{ in year } t$$

Beaver et al. [1982] and [1983] use R_{it} rather than residual returns (CAR_{it}) as a dependent variable. R_{it} is defined on a December 31 to December 31 basis. They pointed out that the reason for using R_{it} is based on the results by Beaver et al. [1980], which indicated the correlation between security returns and changes in earnings is essentially the same under either form of the security return metric. However, this study uses residual returns (*CAR*), because any existing empirical results are comparable to Beaver et al. [1980].

In the second-stage regression in the model unsystematic returns (u) are summed from May to July in year t (not from January to July), because unlike the first research it is not necessary to examine the time-series behavior of *CAR* and announcements of *SIN* and *CIN* are made from May to July (see Tables 1 and 2).

If H_{N2} is correct, then β_2 in the two-stage regression shown above will be equal to 0. Therefore, if $\beta_2=0$ can be rejected at conventional levels of significance, it follows that *CIN* has incremental information content above that contained in *SIN*.

In addition to examining the incremental information content of *CIN* (Panel A), it is possible to "turn the tables" and to examine the incremental content of *SIN* using the following model (Panel B):

First-stage regression

$$SIN_{it}=\alpha_t+\beta_t CIN_{it}+Z_{it}$$

Second-stage regression

$$CAR_{it}=\alpha_t+\beta_{1t}CIN_{it}+\beta_{2t}Z_{it}+\mu_{it}$$

Panel B may be useful not only to check the stability of the results of Panel A, but also to test the null hypothesis H_{N3}.

V. *Results of First Analysis*

Table 4 shows the number of firms that belong to each category across the years. In six of the eight years the number of firms in category A is the largest, and in the other two years category D is the largest. Furthermore, the number of firms in combined category (A+D) is overwhelmingly larger than in combined category (B+C). This implies that

TABLE 4.
The Number of Firms Belonging to Each Category

	Category A	Category B	Category C	Category D	Total
1979	160	8	11	55	234
1980	178	4	8	44	234
1981	108	23	15	88	234
1982	124	24	5	81	234
1983	86	23	7	118	234
1984	142	17	16	59	234
1985	181	7	12	34	234
1986	85	16	11	122	234

TABLE 5.
Monthly Behavior of U in Each Category across the Year

		Jan.	Feb.	Mar.	Apr.	May	June	July	May~July
1979	A	1.05	2.01	3.61	4.79	5.09	7.99	9.49	4.70
	B	0.89	1.98	3.05	3.51	4.45	5.82	6.95	3.44
	C	0.95	1.76	2.49	4.48	5.01	6.99	8.32	3.84
	D	0.53	1.21	1.01	1.28	1.01	0.99	0.97	−0.31
1980	A	1.02	2.33	3.49	5.27	5.02	8.39	9.81	4.54
	B	0.78	2.00	2.87	4.61	4.15	5.53	7.53	2.92
	C	0.78	1.84	2.24	2.74	4.82	6.71	8.22	5.48
	D	0.49	1.15	0.97	1.24	1.25	1.26	1.99	0.75
1981	A	0.89	2.25	5.36	5.40	6.77	8.49	9.03	3.63
	B	0.75	2.16	4.69	4.99	4.21	4.00	4.08	−0.91
	C	0.74	2.11	4.22	4.01	5.01	5.49	6.58	2.57
	D	0.54	0.91	0.32	−0.50	−1.78	−1.97	−1.99	−1.49
1982	A	0.83	1.27	2.84	4.52	6.43	7.71	8.24	3.72
	B	0.65	1.01	1.89	3.25	3.83	4.20	4.45	1.20
	C	0.65	1.00	2.52	3.79	5.16	5.28	6.24	2.45
	D	0.43	0.84	0.51	0.36	−0.71	−1.18	−3.27	−3.63
1983	A	0.81	2.51	5.11	4.69	6.31	7.68	8.31	3.62
	B	0.70	2.12	4.80	4.25	4.11	4.00	3.82	−0.43
	C	0.69	1.68	2.82	4.03	4.86	6.11	6.37	2.34
	D	0.51	1.51	3.32	−0.27	−0.89	−1.22	−2.79	−2.52
1984	A	1.01	3.11	4.92	4.82	6.27	7.01	7.61	2.79
	B	0.98	2.21	3.62	4.01	4.22	4.21	4.10	0.09
	C	0.99	2.93	2.84	3.87	5.61	5.99	6.41	2.54
	D	0.63	0.82	−0.61	−1.00	−1.49	−2.56	−2.98	−1.98
1985	A	1.00	2.89	4.78	4.47	6.35	7.25	8.65	4.18
	B	0.91	1.84	3.15	3.61	3.47	2.85	3.03	−0.58
	C	0.89	2.63	2.98	3.63	5.53	5.88	6.31	2.68
	D	0.68	1.01	−0.31	−0.92	−1.51	−2.37	−3.02	−2.10
1986	A	1.22	2.05	3.99	4.55	6.91	7.49	8.89	4.84
	B	0.91	1.84	3.15	3.61	3.47	2.85	3.03	−0.58
	C	1.01	2.35	2.52	2.98	4.95	5.33	6.48	3.50
	D	0.76	0.87	0.70	−1.25	−1.83	−2.54	−2.79	−1.54

FIGURE 1.
Monthly Behavior of U in 1979

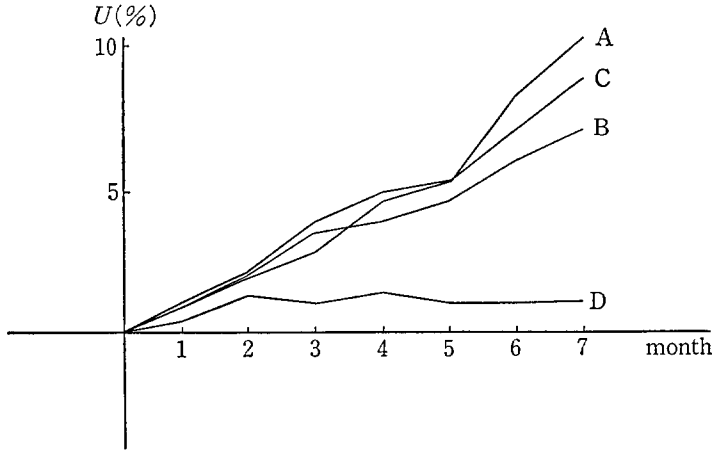
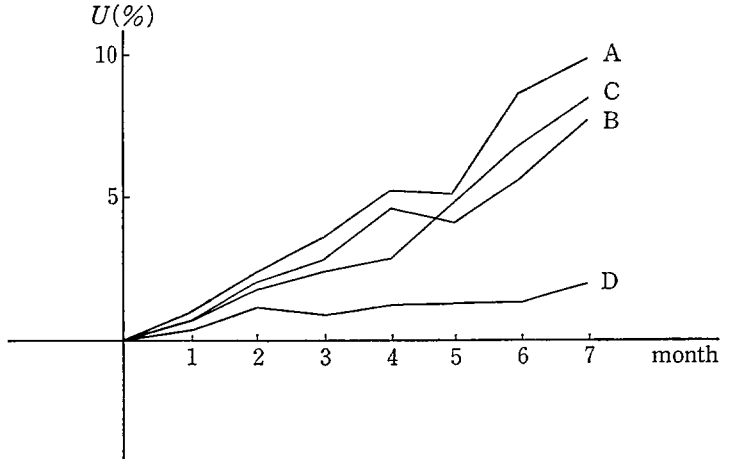


FIGURE 2.
Monthly Behavior of U in 1980



the correlation of signs between *SIN* and *CIN* is high.

The figures for $U_t(t=1, 2, \ldots, 7)$ in each category are shown in Table 5. Those are also graphed in Figures 1 to 8. These figures help to visualize the time-series behavior and order of the level of *U*.

In order to test H_{N1}, Table 3, which suggests the prediction of the behavior of *U* in relation to the information processing patterns followed by investors (market), requires us to pay more attention to the behavior of categories B and C.

If H_{N1} is valid or pattern III is followed by investors, it would be difficult to observe the difference in the behavior between category B and category C. Several interesting

FIGURE 3.
Monthly Behavior of U in 1981

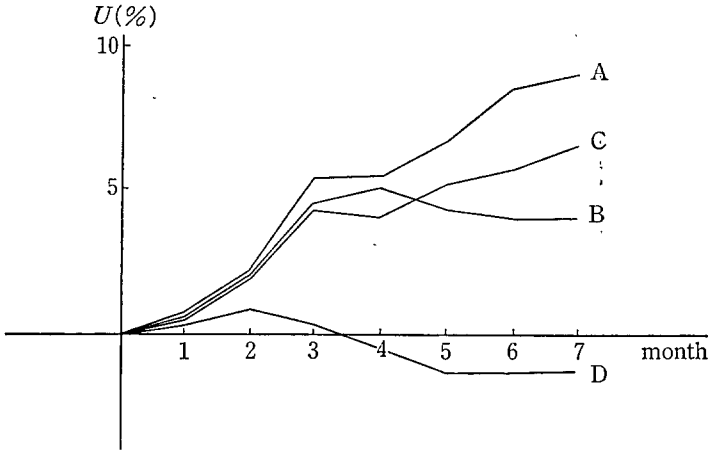
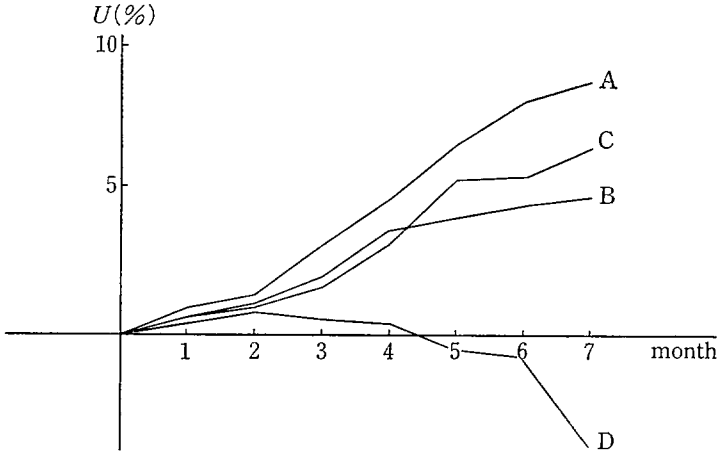


FIGURE 4.
Monthly Behavior of U in 1982



trends are found from Figures 1 to 8 (and Table 5). U^B and U^C reverse every May in six years and April in one year. Furthermore, the order of the level of each category's U from May on of every year is consistently (A>C>B>D). These results coincide with the type of investor information processing behavior presented by pattern II.

Special caution should, however, be exercised when judging from the Figures which pattern is followed. They indicate that it is appropriate to partition the test period into two subperiods—January to April and May to July—, and observe the behavior of U in each period. Those subperiods can be described as the "non-disclosure period" and the "disclosure period," respectively.[15] Two distinctive patterns could be discovered depending

[15] The terminology is based on the distribution of earnings announcements (see Table 2).

FIGURE 5.
Monthly Behavior of U in 1983

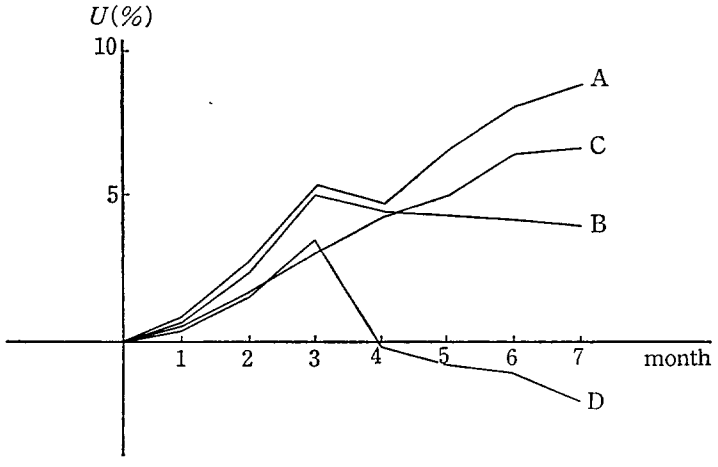
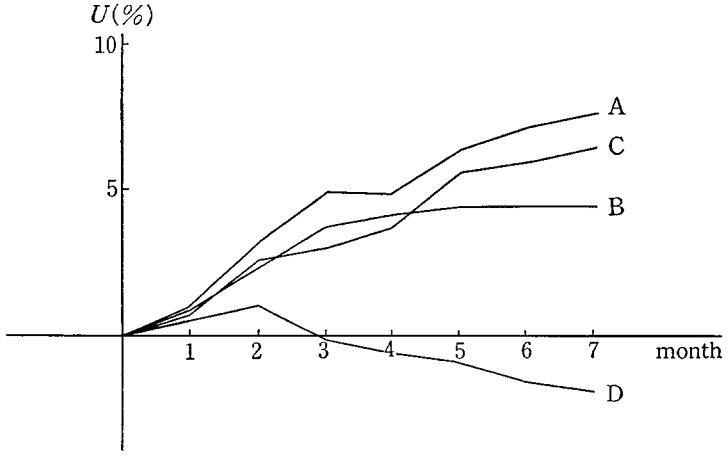


FIGURE 6.
Monthly Behavior of U in 1984



on the subperiod.

Taking a look at the non-disclosure subperiod, the order of levels of U for each category is consistently {A>B>C>D} except in 1979, while it is universally {A>C>B>D} for the disclosure subperiod. These robust findings may allow us to draw the following inferences. Investors have already revised their expectations about the annual separate earnings based on the semi-annual report released by the end of December. Furthermore, as the fiscal year end is approaching, a large number of analysts' forecasts are released and predicted financial data appear in the Japan Economic Journal. Note that such forecasted data are those of large firms, most of which are parent companies. To put it differently, accounting information available to investors in the non-disclosure period is on a separate

FIGURE 7.
Monthly Behavior of U in 1985

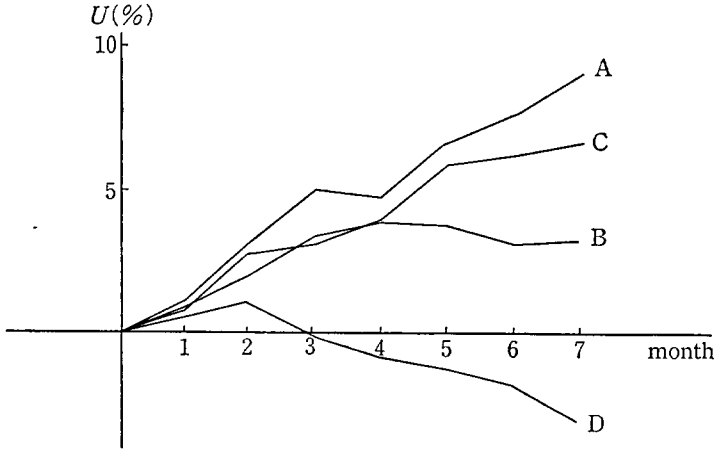
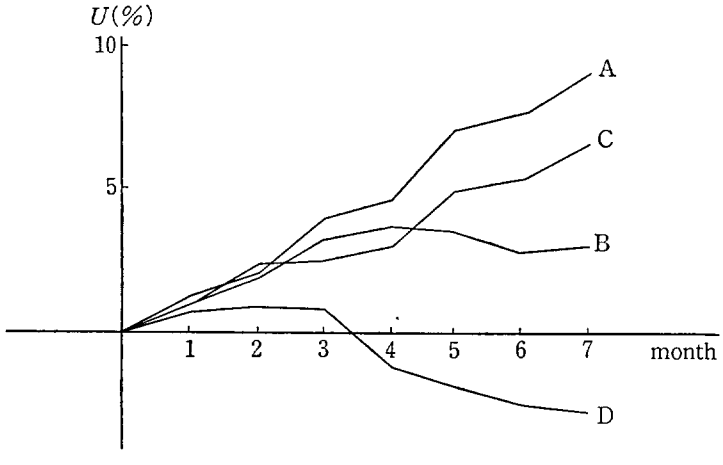


FIGURE 8.
Monthly Behavior of U in 1986



basis, so that stock prices in that period may reflect their expectations about separate earnings data. The question as to which pattern is more dominant in that period, therefore, is irrelevant because of the limited availability of forecasted data on a consolidated basis.

Regarding the disclosure subperiod, as stated above, the reversion of U^B and U^C in May coincides with Pattern II, and the relation between U^B and U^C ($U^C > U^B$) over the whole disclosure period may support the inference that *CIN* have incremental information content beyond that contained in *SIN*. These can also be reinforced by U^X_{DIS} which is calculated only for the disclosure subperiod (May to July).

U^X_{DIS} is shown in the righthand column in Table 5. The order of levels of U^X_{DIS} is consistently the same from 1979 through 1986 as that of U^X. Interestingly, U^B_{DIS} is not

only significantly lower than U^C_{DIS}, but also U^B_{DIS} is negative in 1981, 1983, 1985 and 1986, while U^C_{DIS} is universally positive. These findings suggest that investors strongly react to the incremental factor of *CIN*. Such investor behavior may be generated by an information processing pattern which gives more weight to *CIN* than *SIN* in the disclosure subperiod.

Let us further examine the validity of these inferences using statistical tests. Making six pairs based on the combinations of four categories enables us to apply the Mann-Whitney *U* test to each pair. Table 6 shows the significance levels from the Mann-Whitney *U* Test (two-tailed). Additionally, the significance levels of a *t* test (two-tailed) which was also applied are shown in Table 7.

First, the significance level of Pair B/C using the Mann-Whitney *U* Test varies across the years. In two years the hypothesis that central locations of populations of category B and category C are identical is rejected at 0.05 level. The overall significance level of Pair B/C indicates that H_{N1} is rejected at 0.10 level both by the Mann-Whitney *U* Test and *t* Test.

Tables 6 and 7 also make it possible to test the incremental information content of *CIN*. Let's turn to Pair A/B. The difference in signs between categories A and B lies only in the signs of *CIN*. Thus, if the null hypothesis, that is, that categories A and B equally affect stock prices (residual returns) is rejected at conventional levels of sigfinicance, then

TABLE 6.
Significance Levels from the Mann-Whitney U Test of Pairwise Category

	A/B	A/C	A/D	B/C	B/D	C/D
1979	0.041	0.049	0.018	0.151	0.013	0.018
1980	0.051	0.045	0.011	0.149	0.023	0.015
1981	0.023	0.052	0.013	0.067	0.033	0.018
1982	0.022	0.057	0.009	0.078	0.022	0.026
1983	0.016	0.038	0.012	0.037	0.029	0.013
1984	0.032	0.049	0.013	0.059	0.027	0.034
1985	0.027	0.047	0.009	0.135	0.018	0.015
1986	0.009	0.032	0.007	0.042	0.041	0.038
Mean	0.028	0.046	0.012	0.090	0.027	0.022

TABLE 7.
Significance Levels from t Test of Pairwise Category

	A/B	A/C	A/D	B/C	B/D	C/D
1979	0.047	0.078	0.008	0.155	0.014	0.017
1980	0.049	0.062	0.007	0.178	0.032	0.019
1981	0.026	0.048	0.008	0.042	0.031	0.023
1982	0.021	0.046	0.009	0.104	0.025	0.017
1983	0.018	0.057	0.012	0.043	0.038	0.016
1984	0.021	0.063	0.011	0.073	0.032	0.038
1985	0.031	0.052	0.012	0.153	0.027	0.017
1986	0.017	0.038	0.013	0.047	0.032	0.027
Mean	0.029	0.056	0.010	0.099	0.029	0.022

CIN have incremental information content above that contained in *SIN*. The same test is relevant to Pair C/D.

As far as Pair A/B is concerned, the null hypothesis is rejected at the 0.05 level in almost all years (in all years using the *t* Test), and overall at the 0.028 (0.029 using the *t* Test) level. On the other hand, as far as Pair C/D is concerned, the null hypothesis is rejected at the 0.05 level in all years (the same using the *t* Test), and overall at the 0.022 (the same using *t* Test) level. These results provide the strong supporting evidence for the argument that *CIN* have incremental information content.

Within the framework of the first analysis which exploits the signs of earnings variables, it is possible to "turn the tables," that is, to examine the incremental information content of *SIN* by using significance levels of Pair A/C and B/D. If the null hypothesis that the means of category A and category C are identical is rejected, then *SIN* have incremental information content.

Pair A/C is significant at the 0.05 level in six years (in three years using the *t* Test), and overall at the 0.046 (0.056 using the *t* Test) level, while Pair B/D is significant at 0.05 level in seven years (in all years by *t* Test), and overall at the 0.027 (0.029 using the *t* Test) level. What needs to be noted is that significance levels of Pair A/C and B/D are lower than those of Pair A/B and C/D. This implies that *SIN* have incremental information content above that contained in *CIN*.

VI. *Results of Second Analysis*

As stated earlier, the regression using *SIN* and *CIN* has a collinearity problem similar to the relationship between historical cost earnings and current cost earnings[16] and between accrual earnings and cash flows.[17] Table 8 shows correlations between *SIN* and *CIN* using three methods—the first is in absolute terms (method I), the second is changes in absolute terms (method II) and the third is percentage changes (method III).

As can be seen in Table 8, method III, which adopts percentage changes as independent variables, considerably reduces each year's correlation coefficients in five years, and reduces the overall correlation coefficients for method I and method II by 25% and 14% respectively. Use of method III therefore mitigates the effects of the collinearity problem. It is necessary, however, to control for extreme values when using percentage changes in earn-

TABLE 8.
Correlations Between Separate Earnings and Consolidated Earnings

	1979	1980	1981	1982	1983	1984	1985	1986	Overall
Method I	0.865	0.943	0.924	0.936	0.908	0.937	0.960	0.851	0.987
Method II	0.885	0.925	0.810	0.901	0.928	0.865	0.908	0.805	0.863
Method III	0.674	0.624	0.877	0.340	0.934	0.504	0.669	0.746	0.720

[16] For research focusing on the relations between historical cost earnings and current cost earnings based on a time-series analysis, see Bernard and Ruland [1987].

[17] For recent attempts to explore the relations between accrual earnings and cash flows, see Wilson [1986 and 1987], Rayburn [1986] and Bowen et al. [1987].

ings variables. In cases where levels of income are very low, the percentage changes become extremely high. Thus, those samples are excluded from the analysis. Additionally, cases where losses occur in the prior year are excluded, resulting in a slight reduction in the number of sample firms. This exclusion criterion may give rise to prhblems of "self-selection" bias, because only profitable firms are included in the analysis.

Table 9 indicates the first-stage results in the two-stage regression which focuses on the incremental part of information of *CIN* (Panel A). In the first-stage regression, the level of r^2 is considerably high and the regression coefficient is significant at <0.01 level in all years. Those findings mean that there is a considerable amount of information common to both earnings variable.s

Table 10 shows the second-stage results in the disclosure subperiod. The regression coefficients (β_2) of the residual factor of *CIN* are significant at the 0.01 level in 3 years, and at the 0.05 level in one year. In other words, they are significant at least at the 0.05 level in half of the whole period. Furthermore, signs of the coefficients are positive in almost all years. On the other hand, the regression coefficient (β_1) of *SIN* is significant at the 0.05 level in only one year. In addition, the coefficient is negative in six of eight years.

Beaver et al. [1982] state that this approach is a severe test to impose on pre-holding gains (i.e., *CIN* in the present study) because of the considerable common explanatory power with respect to stock price changes. Christie et al. [1984] also point out that the two-stage approach assigns all of the common explanatory power contained in the independent variables to β_1.

Taking into account these comments, the second-stage results strengthen the significance of the regression coefficient (β_2). The findings have two implications. First, it would be reasonable to say that *CIN* have incremental information content beyond that

TABLE 9.
First-Stage Results in the Two-Stage Regression (Panel A)
$(CIN_{it}=\alpha_t+\beta_t SIN_{it}+Z_{it})$

	α	β (t-value)	r^2
1979	0.059	0.646 (10.049)***	0.671
1980	4.015	0.991 (8.217)***	0.576
1981	−0.710	0.910 (18.420)***	0.873
1982	2.106	1.018 (8.973)***	0.619
1983	7.969	0.725 (7.084)***	0.501
1984	2.404	1.271 (13.278)***	0.782
1985	0.591	0.618 (7.922)***	0.977
1986	2.181	0.923 (8.303)***	0.831

***Siginificant at 0.01 level

TABLE 10.
Second-Stage Results in the Two-Stage Regression (Panel A)
$(CAR_{it}=\alpha_t+\beta_{1t}SIN_{it}+\beta_{2i}Z_{it}+\mu_{it})$

	α	β_1	β_2	r^2
		(t-value)	(t-value)	
1979	−2.861	−0.720	13.053	0.374
		(−0.295)	(4.990)***	
1980	1.823	−1.033	7.951	0.336
		(−2.036)**	(4.772)***	
1981	−5.401	−0.189	15.610	0.230
		(−0.100)	(3.877)***	
1982	1.236	−1.192	3.662	0.154
		(−0.512)	(1.003)	
1983	7.270	1.343	−0.093	0.120
		(0.448)	(−0.026)	
1984	−1.202	2.256	10.760	0.136
		(0.725)	(2.020)**	
1985	−1.996	−1.788	0.053	0.092
		(−0.487)	(0.211)	
1986	1.012	−0.372	1.726	0.201
		(−0.171)	(0.934)	

**Significant at 0.05 level.
***Significant at 0.01 level.

contained in *SIN*. Secondly, investors react positively to positive changes in *CIN*, while they do not necessarily react positively to positive changes in *SIN* in the disclosure subperiod when those two earnings numners are available to the market.

The first implication is apparently consistent with the evidence obtained by the first analysis, and also reinforces the existence of incremental information content of *CIN*. The former of the seocnd implication is plausible and consistent with the evidence obtained by the first analysis. Nevertheless, the latter is difficult to interpret. At least three reasons why the coefficient of *SIN* is negative in some years are conceivable. First, return implications of *SIN* are already impounded in stock prices prior to their announcements through analysts' forecasts and projected financial data in the Japan Economic Journal in addition to the revisions based on interim reports. Second, as suggested by the evidence in the first analysis, investors strongly react to the incremental factor of *CIN* based on Pattern II, resulting in adverse effects on the information content of *SIN*. Third, the model of the second analysis may be too severe to the information content of *SIN* in that the whole year (July to July) was not adopted as the period and in that the non-disclosure period was excluded in computing *CAR*.[18]

Table 11 shows the results of "turning the tables." In Panel B, β_2 in turn represents the incremental effects of *SIN*. The regression coefficients are significant at the 0.01 level in three years, and at the 0.05 level in one year. Turning to the coefficient of *CIN* (β_1), they are significant at the 0.01, 0.05, and 0.10 levels in three years, respectively. Note that signs

[18] This also applies to *CIN*, but the exclusion of the non-disclosure subperiod would have little affect upon the information effect of *CIN* because of the limited availability of forecasts in the non-disclosure period.

TABLE 11.
Second-Stage Results in the Two-Stage Regression (Panel B)
$(CAR_{it}=\alpha_t+\beta_{1t}CIN_{it}+\beta_{2t}Z_{it}+\mu_{it})$

	β_1 (t-value)	β_2 (t-value)
1979	5.897	−12.301
	(2.062)**	(−4.586)***
1980	2.761	−3.261
	(1.300)	(−3.261)***
1981	3.023	−13.212
	(1.080)	(−4.777)***
1982	1.235	−2.010
	(0.733)	(−1.721)*
1983	1.476	1.580
	(0.855)	(0.823)
1984	8.112	−4.860
	(3.001)***	(−1.582)
1985	3.027	0.072
	(2.003)**	(0.069)
1986	2.397	−0.219
	(0.987)	(−0.096)

*Significant at 0.10 level.
**Significant at 0.05 level.
***Significant at 0.01 level.

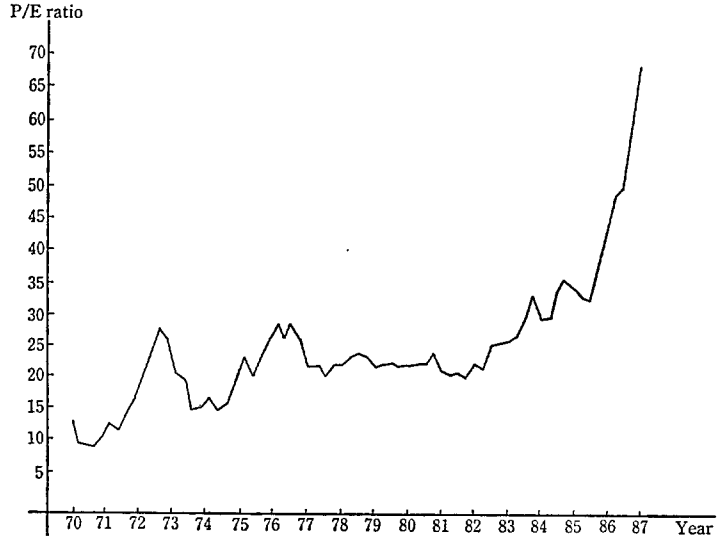
of β_2 are negative in almost all years. This evidence could be explained by the three possible reasons described above.

In a different context to the incremental information approach, it is also known from Table 10 that the coefficient of determination, r^2, is relatively high especially in earlier years, and that is gradually decreases as time passes. It suggests that information other than so-called fundamental variables, such as earnings, may be increasingly influencing the Japanese securities market.

Figure 9 plots the average P/E ratio of issues listed in the first section of TSE on a quarterly basis over 1970 through the middle of 1987. In Japan, it has been traditionally said that the normal level of P/E ratio is 20 times. Figure 9 indicates that the departure from the normal level began around the end of 1982 and that, since then, the average P/E ratio has increased at an accelerated rate. Apparently, from Table 11, the power of earnings (both separate and consolidated earnings) to explain the behavior of returns has reduced since around 1982. It is uncertain as to whether there is a causal relationship between those two trends, because the stock price, which is the numerator of the P/E ratio, is influenced by not only firm-specific factors but also by macro economic (market wide) factors. The dependent variable in the two-stage regression conducted here is the firm-specific return.

This subfinding, however, implies that the Japanese "abnormally" high P/E ratio cannot be explained by reference only to the macro economic factors (for example, Japan's strong competitive edge). It could be a clue to exploring causal factors for the Japanese high P/E ratio. A more detailed model would be necessary to test whether stock price behavior in the Japanese stock market influenced by the use of alternatives to the so-called fundamental

FIGURE 9.
Trend of the Average P/E Ratio of Issues in the First Section of Tokyo Stock Exchange



*P/E ratio is measured at the end of each quarter.

analysis common to the U.S.[19]

VII. *Supplementary Analysis*

The following inferences can be drawn from the first and second primary analyses. (1) Investors give more weight to *CIN* than *SIN*. (2) *CIN* has incremental information content beyond that contained in *SIN*. (3) *CIN* corresponds positively with residual security returns. (4) *SIN* has incremental information content, but less than *CIN*. (5) *SIN* corresponds negatively with residual security returns.

However, these results seem inconsistent with the dividend calculation system required by the Japanese Corporation Law. That is, the earnings available for dividends must be calculated based on the separate income statement. Table 12 indicates the correlations between the amount of dividends actually paid and *SIN* and *CIN* (in absolute terms) of sample firms. The dividends include interim dividends as well as annual dividends.

Obviously, *SIN* is more highly associated with the dividends than *CIN*. Contrary to this dividend paying practice, the findings described above imply that the market believes

[19] For example, Bildersee [1975] conducted regressions of market β on six fundamental variables: debt-to-common equity ratio, preferred equity-to-common equity ratio, sales-to-common equity ratio, current ratio, standard deviation of earnings-to-price ratio and accounting β. Hochman [1983] found that the model based on financial leverage, dividend yield and accounting β had superior quality in predicting the next period's market β. Another candidate for testing the validity of fundamental analysis in Japan is the BARRA model.

TABLE 12.
Correlations Between Dividends and Separate Earnings/Consolidated Earnings

	1979	1980	1981	1982	1983	1984	1985	1986
Separate Earnings	0.574	0.603	0.634	0.471	0.482	0.599	0.562	0.339
Consolidated Earnings	0.385	0.343	0.279	0.341	0.362	0.224	0.426	0.172

that *CIN* reflect the dividend paying ability of companies better than *SIN*, within the framework of Discounted Dividend Model of valuation.

Finally, an additional test was conducted to supplement the results of the primary analyses. This test focuses attention upon the risk aspect from the return aspect for investors.

Beaver, Kettler and Scholes [1970] and Beaver and Manegold [1975] conducted research into the relationship between market β and "accounting β," which is basically calculated using accounting earnings variables. They discovered rather high relations between them on an individual security basis, and higher relations on a portfolio basis. What needs to be noted is that their research is based upon accounting earnings on a consolidated basis. Even in the United States, therefore, the relations between market β and accounting β on non-consolidated basis is an open issue.

The supplementary research consists of the following four steps:

(i) Accounting β of sample firms are calculated using 8 year time-series earnings data both on separate and consolidated bases.

(ii) Accounting β of each firm is ranked in ascending order.

(iii) Market β, which was used in calculations of *CAR*, is ranked in ascending order.

(iv) Spearman's rank correlation coefficients are calculated between market β and accounting β_{SIN} as well as between market β and accounting β_{CIN}.

Results are as follows:

Market β vs. Accounting β_{SIN}: 0.53
Market β vs. Accounting β_{CIN}: 0.65

Both coefficients are significant at the 0.005 level. Nevertheless, the higher level of the coefficient for *CIN* implies that *CIN* is also more useful in evaluating securities' risk than *SIN*.

VIII. *Concluding Remarks*

One of the major findings in this research is that there are two distinct patterns relating to the association between stock returns and separate/consolidated earnings, depending on the subperiod. In the non-disclosure subperiod, returns depend upon separate earnings (expectations), while in the disclosure subperiod, returns react strongly to announced consolidated earnings, based upon the pattern where investors give more weight to consolidated earnings.

Another major finding is that consolidated earnings have significant incremental information content beyond that contained in separate earnings, though there is a considerable

amount of information common to both earnings. The existence of consolidated earnings' incremental content and the pattern giving more emphasis on consolidated earnings is indirectly supported by the higher correlation between market β and accounting β based on consolidated earnings than that based on separate earnings. This suggests that the research succeeds in accomplishing "triangulation," which generates synergy amongst the three analyses undertaken.

However, with respect to the incremental information content of separate earnings, a subgoal of the research, it is difficult to say that triangulation has been accomplished. The results in the first analysis identify the existence of incremental information content in separate earnings. On the other hand, the evidence in the second analysis indicates that separate earnings have negative incremental content in some years. This may run counter to intuition. Nevertheless, the possible reasons for this result given in Section VI may in part mitigate the negative synergy.

Although a simple comparison of stock price behavior associated with accounting earnings between the U.S. and Japan would be risky, it may be reasonable at least to point out that returns in Japan largely depend upon consolidated earnings just like the U.S. To sum up, as far as the disclosure period is concerned, similar mechanisms seems to characterize market reactions to earnings information in the U.S. and Japan.

The robust findings regarding consolidated earnings' information content contradict the legal framework which mandates the calculation of the amount of dividend based on separate earnings. They imply that the market relies upon companies' dividend paying ability based upon consolidated earnings, as long as the discounted dividend valuation model is valid. This reveals an important divergence between the capital market and legal system.

Finally, the empirical results suggest that the degree of association between returns and earnings (both separate and consolidated earnings) is decreasing in Japan. There are two possible explanations for this result. First, variables other than fundamental variables, of which earnings are representative, may play a more important role than before in the stock market. This provides a variable starting point for further research exploring the causes for "abnormally" high P/E ratio in Japan. Secondly, as the first reason implies, earnings may be less useful in making investment decisions in Japan. As stated earlier, this may be partly because consolidated financial statements may include noise,[20] thereby failing to represent the economic reality of Japanese firm's activities. Furthermore, they are not likely to reflect transaction cost implications, which are among the major motivations for economic decisions.

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[20] The possible sources for noise are the 10% materiality guideline, an objective but inflexible 20% cutoff point for the application of the equity method, the intercompany share holdings popular in Japan, disregard of companies' network with subcontractors as found so frequently in Japan, and nondisclosure of information regarding segment profitability.

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