MARKET REACTION TO ADOPTION OF SFAS NO. 131 ON SEGMENT REPORTING

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ABSTRACT

The purpose of this paper is to test the information content of Statement of Financial Accounting Standard No. 131, "Disclosures About Segments of an Enterprise and the Related Information." A random sample of one hundred and eleven companies of those listed in *Business Week Global 1000* for the year 1997 was selected. These companies disclosed segment information before 1996 and applied the new standard afterward. Three statistical techniques; a dummy variable, analysis of variance, and contingency table analysis were utilized to test whether the new standard conveys useful information. The results indicate that adoption of the new standard does not statistically convey significant additional information that is relevant to the investors and other users of financial statements. Investors and other users of financial statements have already had access to the information disclosed under SFAS No. 131.

INTRODUCTION

The Financial Accounting Standards Board issued, in 1976, the Statement No. 14, "Financial Reporting for Segments of Business Enterprise." It requires listed companies to disclose segment information by both line of business and geographic area in their annual reports. The lack of precise definition of business segment and lack of consideration of internal organization of the company, as well as the relatively high cost of providing such information, led financial statement users to express great dissatisfaction with the statement. Many, including the Association of Investment Management Research (AMIR 1993), complained that the definition of segment is imprecise and that there are many practical problems in applying this definition. The AMIR also recommended that segment disclosure in annual reports should be based on the internal organization of the company.

The AICPA Special Committee on Financial Reporting (1994) provided similar recommendations and asked standard setting bodies to give the highest priority to this issue. Statement of Financial Accounting Standard (SFAS) No. 14 was subsequently amended by (SFAS) No. 94, "Consolidation of All Majority-Owned Subsidiaries," to remove the special disclosure requirements for previously unconsolidated subsidiaries and later was superseded by SFAS No. 131, "Disclosures About Segments of an Enterprise and the Related Information," but retains the requirement to report information about major customer. The new standard requires that a public business enterprise report financial and descriptive information about its operating segment. SFAS No. 131 adopted a management approach, focusing on the way in which

management organizes segments internally to make operating decisions and to assess performance. The objective of this approach is to facilitate consistency between internal and external reporting. Information may be segmented by product, service, geographic area, customer type, or legal entity. For each operating segment, firms must report segment profit or loss, certain items of revenue and expense, segmental assets and other items. The statement establishes standards for the way that public business enterprises report information about operating segments in annual financial statements and requires that those enterprises report selected information about operating segments in interim financial reports issued to shareholders. The Statement became effective for years beginning after December 1997.

Recent studies by Herrmann and Thomas (2000) and Street et al. (2002) show that, with adoption of the new standard, companies are reporting greater numbers of line of business (LOB) segments, more information about each segment, and there is more improvement in consistency of segment information with other parts of the annual reports. They also show that for company-wide disclosure, the proportion of country-level geographic segment disclosure has increased. The results of these studies reflect only the behavior of the management or suppliers of information. What is missing in previous studies is the analysis of behavior of the other side of the market that is demand side of information. The purpose of this study is to focus on the demand side and test the market reaction to the adoption of the new standard.

LITERATURE REVIEW

Researchers on Statements of Financial Accounting Standard No. 14 and No.131 have examined different aspects of their application in order to evaluate their usefulness. The impact of segment information disclosure on share prices was examined by Horwitz and Kolodny (1977) and Ajinkya (1980). Both of these studies did not find any significant differences in abnormal returns and/or in risk-adjusted returns. Swaminathan (1991), however, using a different methodology, did find pricing effects. Specifically, an increase in share price variability occurred around the first disclosure of segment data along with a decrease in the divergence of analyst forecast following that disclosure. Both of these changes were related to the number of segment disclosed. The evidence on direct security pricing effects of the SEC-mandated data is mixed.

Maines et al. (1997) examined the effect of both industry approach (per SFAS No. 14) and the management approach (per SFAS No. 131) on analyst's judgments and decisions. They found that financial analysts believe segment data are reliable under the SFAS No. 131 approach, where there is greater congruity of internal reporting with external segment reporting. Herrmann and Thomas (2000) surveyed the annual reports of a sample of U.S. multi-segment firms listed in the 1998 *Fortune* 500 to compare the segment reporting disclosure under SFAS No. 131 with those reported the previous year under SFAS No. 14. They found that over two-thirds of the sample firms changed segment definitions upon adoption of the new standard. They show that the application of management approach has resulted in improvements. First, the new standard has increased the number of firms disclosing segment information. Second, companies are disclosing more items for each segment. For enterprise-wide disclosure, the proportion of country-level geographic segment disclosures has increased, while the proportion of broader geographic area segment disclosure has decreased. On the other hand, the number of firms disclosing earnings by geographic segment has declined greatly since the disclosure of this item is no longer required.

Street et al. (2000) assessed the 1997 and 1998 annual reports of a sample of the largest publicly traded U.S. companies to determine whether SFAS No.131 adequately addressed user concerns about segment disclosures and the extent to which the expected benefits set forth in the new standard materialized. The findings suggest that in general the new standard has improved business reporting. The improvement includes the increase in the number of reported segments and significant consistency of segment information in 1998 compared to the year before. However, their findings also suggest that there are yet a few companies that have restructured their segments to avoid reporting additional segment information. Moreover, very few companies continue to report segment information not consistent with the other parts of their annual reports and Management's Discussion and Analysis (MD&A). They also assessed the impact and effectiveness of the new standard with reference to geographic segment disclosures. Their findings show more disclosure of country specific geographic segment data under SFAS 131 as well as more consistency between reportable segment data and other parts of the annual report. However, their research also reveals that the aggregation problem has not been fully resolved. Many companies still provide data based on a highly aggregated basis. Their findings also reveal a lack of voluntary geographic segment disclosures and loss of geographical information about income under SFAS No. 131. In general, the findings of these researchers suggest that there is significant improvement in segment information disclosure.

Berger and Hann (2003) examined the effect of SFAS No. 131 on the information environment. They compared industry-based forecasts of revenue and earnings using SFAS No. 14 data, to forecasts using retroactively disclosed SFAS No. 131 data, in order to measure the new information provided by SFAS no.131 disclosure. Berger and Hann (2003) found that differences in these forecasts are associated with analysts' forecasts and stock prices suggesting that analysts and market participants had access to some of the SFAS No.131 data before it was reported. This is consistent with analysts and market participants relying on private sources of information for these data, in the absence of SFAS No. 131 disclosures.

Venkataraman (2001) argues that although segment information reported under SFAS No. 131 differs from that reported under SFAS No. 14, it is not clear ex ante that the new information is superior, since SFAS No.14 segment information had favorable characteristics. Segment based on products and services (the "industry" approach) is easily understood by investors, and can be compared with industry statistics compiled by government agencies. Unlike SFAS No. 131 segment data, SFAS No. 14 requires that segment data be reported consistent with GAAP. Furthermore, Venkataraman (2001) argues, "based on the analytical literature of Kim and Verrecchia (1991, 1994), that changes in the precision of mandated public disclosures can affect investors' incentives to acquire information. As a result, the effect of SFAS No. 131 adoption on accuracy of analysts' forecasts and on stock prices is an empirical question."

Herrmann and Thomas (2003), and Chen and Zhang (2003) applied a real-options based valuation approach. They developed and tested a model that addressed the incremental value relevance of segment data beyond firm-level accounting data. Their results indicate that segment data, on average, have a material incremental impact on valuation, so ignoring or overlooking such data can cause considerable information loss and valuation error. Moreover, they found that the incremental impact of segment information is significantly different across different firms.

Ettredge et al. (2005) examined the effect of firms' adoption of SFAS no. 131 segment disclosure rules on the stock market ability to predict the firms' earnings. They found that the adoption of the standard increased both the quality and quantity of segment disclosure. The

results provide strong evidence the SFAS No. 131 resulted in an increase in stock price informativeness, both for muli-segment firms and for single—segment firms that became multi-segment. Botosan and Stanford (2005) examined managers' incentives for withholding segment information under SFAF No. 14 and the impact of SFAS No. 14 on analysts' information environment for a sample of firms that previously reported as single-segment firms. They used retroactive disclosure required by SFAS No. 131. The results suggest that the managers of firms forced to initiate segment disclosures under SFAS No. 131 withheld segment information under SFAS No. 14 to protect profits in less competitive industries, not to conceal poor performance as some have alleged. Their results also indicate that the majority of the firms initiating segment disclosures under SFAS No. 131 report segment operations in industries distinct from their firm primary industry. They conclude that the analysts' shift to greater reliance on public information came at a cost in terms of forecast accuracy.

In general, previous studies tested different aspects of segmental reporting required by SFAS No. 131, but very few investigated market reactions to the standard's adoption. The purpose of this paper is to test the impact of application of SFAS 131 on the firm's perceived risk.

SAMPLE SELECTION

Business Week Global 1000 companies was used to identify the U.S. companies. Business Week ranks publicly held companies according to the market capitalization, which is an indicator of size from an investment perspective. Business Week includes 480 U.S.-domiciled companies. Global 1000 companies are likely to have international operations and thus likely to have geographic segments. Hence, a sample drawn from U.S. Global 1000 companies allows for an examination of the impact of SFAS No. 131 on both LOB-based reporting and geographic disclosures provided as enterprise-wide data.

The annual reports for 1997 and 1998 for all U.S. Global 1000 companies were requested. Excluded from the list were those in energy or finance industries (due to SFAS No.131's liberal aggregation criteria for operating segments that operate in similar environments), those that had no segment LOB or geographic disclosure in 1997, those that adopted the SFAS 131 in 1997, and those that were involved in a merger, major acquisition, spin-off, etc.

As indicated by Street, et al, (2000), the last criterion ensures that differences (or lack of differences) identified by the research are primarily a function of the new SFAS No. 131 guidelines as opposed to being driven by changes in the makeup of the companies' operating segments. The researchers reviewed each annual report to identify those companies that disclosed segment data before and after the implementation of SFAS No. 131. Applying the above criteria, as well as dropping those companies that were not listed in the New York Stock Exchange for the period under consideration, the authors identified 111 companies. The previous criterion is necessary to obtain the companies' share prices.

METHODOLOGY

The objective of this paper is to measure the structural change, if any, in beta due to the segmental data disclosure. There are three ways to do that. The first is to use dummy variable technique, the second is to use analysis of variance, and the third is to use contingency table analysis. With respect to the dummy variable, the subject of this inquiry is the single-index market model shown in equation (1).

$$R_{it} = \alpha_i + ß_i R_{mt+} e_{it} \qquad (1)$$

Where R_{it} denotes the return for the $_i$th firm in the $_t$th week; R_{mt} represents the market return for the $_t$th week, α_i and $ß_i$ are the regression intercept and slope, and e_{it} is the unsystematic risk.

Equation (2) is a modified version of the single-index market model shown in equation (1), which is formulated to test the structural change in betas.

$$R_{it} = \alpha_{il} + ß_{il} R_{mt} + ß_{i2} (D_t R_{mt}) + u_{it} \qquad (2)$$

The D_t variable in equation (2) is a binary variable which assumes the value of unity in the period of segmental reporting disclosure and zero elsewhere. The coefficient of the dummy variable $(D_t R_m) ß_{i2}$ measures the differential effect of segmental reporting disclosure on beta $ß_{i1}$ for the $_i$th firm. However, over the non-disclosure period, equation (2) reduces to equation (1). If the beta for the $_i$th firm differs over the non-disclosure and disclosure of segmental data, then $ß_{i2}$ will be significantly different from zero. T-test was used to test the significance of individual coefficients while F-test was used to test the significance of whole regression. F-test usually is used when there is more than one independent variable. If t-test is significant for individual coefficients while F-test for the whole regression was insignificant, it means that each coefficient was related to different samples. Therefore, it is necessary for F-test to be significant in order to accept or reject a hypothesis.

An alternative test procedure is to use analysis-of covariance (ANCOVA). It involves splitting the time series in question into non-overlapping sub-periods differentiated by some critical event. It is here the date of segment disclosure. The sum of squared residuals obtained by applying separate regressions to sub-period 1 (pre-disclosure) and sub-period 2 (post-disclosure) data are compared against the sum of squared residuals from pooled regression to test whether a statistically significant shift in beta has occurred.

The advantage of a dummy variable is that only a single regression needs to be run. Moreover, (ANCOVA) does not explicitly tell which coefficient (intercept or slope) is different, or whether both are different between the two periods. In addition, since pooling increases the degrees of freedom, it may improve the relative precision of the estimated coefficient. However, in order to validate the results, both techniques will be used to determine if there is any difference or the results of one method support the other's results. Starting with the dummy variable technique:

Thus, equations (1) and (2) and analysis of variance shown above will be used to test for the following null hypotheses:

Null hypothesis:

There is no difference in the firm's perceived risk before and after the implementation of SFAS No. 131. That is

$$H_0 : ß_1 = ß_2$$

Where $ß_1$, and $ß_2$ represent the firm's perceived risk before and after the disclosure of segmental data, respectively.

The third alternative test procedure is to use the Contingency Table. In order to use the significant effect of SFAS No. 131, we can carry out the standard contingency table analysis using the formula,

$$X^2 = \sum \frac{(O_{ij} - \hat{E}_{ij})^2}{\hat{E}_{ij}} \qquad (3)$$

where O_{ij} is the observed frequency and $\hat{E}_{ij}$ is the expected frequency in each cell. The computed value follows a Chi-square distribution with (r-1)(c-1) degrees of freedom, r and c being the number of rows and columns, respectively. The null hypothesis for this test is that returns of the companies in the period before implementation of the SFAS No. 131 is independent of their returns after the standard is implemented.

For testing the effect of the new standard, we divide the entire sample period into two sub-periods, the sub-period before implementation of the standard and the sub-period after. Average market returns is used as criteria for determining which companies make high and which make low returns. Those companies that on average make more than market returns are considered as high returns and others as low returns companies.

RESULTS

The decision rule is that if the coefficient of the dummy variable is significant at the .05 level for individual firms in this group, then the null hypothesis, that LOB as a first segmental reporting disclosure has no impact on firm's perceived risks as represented by betas, will be rejected. This means that the application of SFAS No. 131 conveys useful information. A t-test will

TABLE I. DESCRIPTIVE STATISTICS: COEFFICIENT AND *T*-TEST

Variable	***N***	**Mean**	**Median**	**TrMean**	**StDev**	**SE**
Mean						
Coef.	111	0.00806	-0.00132	-0.00191	0.10153	0.00964
t-test	111	-0.106	-0.180	-0.185	1.149	0.109

Variable	**Minimum**	**Maximum**	**Q1**	**Q3**
COEF.	-0.09892	1.04300	-0.00614	0.00284
T-TEST	-2.160	7.230	-0.850	0.330

* Critical value is 1.980 at the 155 degrees of freedom.

be used to determine whether beta changes significantly with LOB segmental reporting disclosure.

The results of computed beta together with computed t-test are reported in Table I above. The coefficients mean of the dummy variable is 0.00806 while the mean for t-test is -0.106, which is insignificant at a 95% level of confidence. Therefore, when these companies implemented SFAS

No. 131 share prices did not move to signal the arrival of useful information that means it does not convey any significant information.

Table II shows the results of F-test for the whole regression. The mean for F-test is 10.57, which indicates that the relationship between independent variables and the dependent variable is weak. When the regression is run without the dummy variable, the mean of F-test is significantly higher, 32.78. Probably, this standard reduces the cost of preparing such information and saves time as will.

TABLE II. DESCRIPTIVE STATISTICS: F-TEST FOR THE WHOLE REGRESSION

Variable	**N**	**Mean**	**Median**	**TrMean**	**StDev**	**SE Mean**
F-Test	111	10.57	2.50	8.72	14.17	1.34
Variable	**Minimum**	**Maximum**	**Q1**	**Q3**		
F-test	0.01	76.90	0.62	17.66		

* Critical value is 3.0 at the 2 and 155 degrees of freedom.

When the ANCOVA is applied, the results will not change. Table 3 shows the results of ANCOVA. The mean for F-test is 0.7843, which is insignificant at the 95% level of confidence.

The results of the contingency table analysis are presented in Table 4. As the table shows, of the 111 companies included in this sample, 43 have high returns and 68 have low returns in sub-period one. In the second sub-period, 34 companies have high returns compared to 77 companies, which have low returns. These patterns indicate that the new standard have not improved companies returns after its implementation.

TABLE III. DESCRIPTIVE STATISTICS OF ANALYSIS OF VARIANCE

Variable	N	Mean	Median	TrMean	StDev	SE Mean
F-TEST	111	0.7843	0.3400	0.6489	1.0312	0.0949
Variable	Minimum	Maximum	Q1	Q3		
F-TEST	0.0000	5.2300	0.0700	1.0275		

* Critical value is 3.0 at the 2 and 155 degrees of freedom.

The critical value of the Chi-square at the five percent level with one degree of freedom is 3.84. Since the value of 2.62 is well within the acceptance region, we cannot reject the null hypothesis of independence. Thus, there is not sufficient evidence to reject the null hypothesis and support the claim that the implementation of SFAS No. 131 affects the companies' returns and conveys useful information.

TABLE IV. RESULTS OF CONTINGECY TABLE

		AFTER:		
		HIGH RETURN	LOW RETURN	TOTAL
BEFORE:	**HIGH RETURN**	**17** **(13.17)**	**26** **(29.83)**	**43**
	LOW RETURN	**17** **(20.83)**	**51** **(47.17)**	**68**
	TOTAL	**34**	**77**	**114**

(Expected counts are printed below observed counts.)

Based on the foregoing results, the hypothesis that there is no difference in the firm's perceived risk before and after the implementation of SFAS No. 131 cannot be rejected. The forgoing results are consistent with the logic of information. It is important to differentiate between two impacts of the usefulness of information. The first is when the role of information is confined only to the reduction of uncertainty surrounding the decision. In this case, the decision is right, but the decision-maker is uncertain. That is because there is insufficient information. The decision-maker at first utilizes the quantitative information given in the annual reports and information from other sources. The role of information (segmental reporting) here is to confirm the previous decision by reducing the spread of probability distribution around the mean, namely reduce uncertainty and to make the decision-maker comfortable with his/her previous decision. In this case, the information is new and useful, but there is no significant reaction in the market to the release of useful information. Its impact can be measured by asking investors and other users of financial statements to assign a probability distribution to their expected return. The difference between the variances prior and after the release of information measures the information usefulness.

The second impact is when the effect of information released extends to induce significant revision in the previous decision. The effect of this kind of information can be captured indirectly by measuring the unusual movement in share prices. Thus, even when the information released is useful, share prices of all companies involved are not expected to be affected. The current results reflect these facts.

Moreover, there are situations in which information has no impact. This could occur when the information disclosed is perceived as useless or redundant. In this case, share prices would not be expected to react to the release of such information.

CONCLUSION

The results of this study indicate that application of SFAS No. 131 does not statistically convey significant additional information that is relevant to the investors and other users of financial statements. Probably, investors and other users of financial statements have already had access to the information disclosed under this standard by different means. Probably, this standard overcomes the drawbacks of the previous one, such as, the lack of precise definition of business segment and lack of consideration of internal organization of the company, as well as, the relatively high cost of providing such information. Since there is no significant useful

information disclosed as the results of this research suggest, the purpose of this standard probably is to reduce the cost of preparing segmental information and to make disclosure easier.

We have used three different statistical techniques in our study to show that our results are robust and independent of the methodology used.

According to the semi strong form of the Efficient Market Hypotheses, the current price of a firm's stock accurately reflects a vast amount of public information about the firm, including new value-relevant information that has just been made public. Assuming this hypothesis is correct, as new information about a firm arrives, the market price of the firm's stocks should immediately change to reflect this information. However, sometimes the stock price does not react to such information because either the information is new, but has no effect on share prices, or the information has an effect on share prices, but the market became aware of and impounded the information before the disclosure. It is possible that the implementation of SFAS No. 131 is of the latter category of information.

It is obvious that FASB (Financial Accounting Standard Board) when issuing SFAS No. 14, focused mainly on financial disclosures that benefit the financial statements' users. It ignored the complexity and the cost of preparing such information. The results of foregoing research {Street et al. (2000), Herrmann and Thomas (2000), Street et al. (2000) indicate that the number of segments disclosed under SFAS No. 131 increased significantly and the number of companies disclosing segments also increased. The results of this research, together with the results of the above research, suggest that FASB should take into consideration not only financial disclosure, but also the cost and the ease of preparing such information.

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