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Sasson Bar-Yosef and Itzhak Venezia

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By

Sasson Bar-Yosef[*] and Itzhak Venezia[**]

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[*] The Hebrew University of Jerusalem. [*] The Hebrew University of Jerusalem, and Free University of Berlin (Bundesbank Chair)

Abstract

    This paper analyzes whether the new business segment reporting disclosure rules, SFAS 131, will actually provide capital market participants with more predictive ability than the previous rules. For this we conduct three experiments. Two experiments with advanced accounting students as subjects, where the experiments differ in the firm the subjects analyze, and the third with professional financial analysts. In each experiment we provide one group of subjects with accounting reports based on the new standard (New Rules Group, NRG), and another group with reports based on the old standard (Old Rules Group, ORG). We ask both groups to forecast several accounting and market values of a firm. We then compare the performance predictions and analyses of the two groups.

    Most of the forecasts of the NRG are neither significantly different from those of the ORG, nor significantly more accurate. Subjects also report the variables that they consider important in their analysis. 25% of the NRG students in Experiment I mention the segment data as being central in their decisions and 33% say they used segment or sector data. Among the analysts in Experiment II the corresponding percentages are 0% and 60%, respectively. Also in experiment III, where the subjects rank the top 4 variables they use in their predictions according to importance, segment repots receive a mediocre rank. It therefore appears that the reports according to the new rules, whereas noticeable by the subjects, do not have a major positive impact on their responses. The subjects also exhibit a considerable degree of overconfidence.

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I. **Introduction**

As of December 1997 companies have been required to report on the various

segments of their business in compliance with the new standard SFAS 131 (FASB,

1997), replacing the previous standard FAS 14 (FASB, 1976). According to the new

standard, companies are required to disclose specific information regarding the

various segments of their operations, according to 'the managerial approach'. That is,

if senior company management makes decisions based on separate reports of certain

business segments, then these are the business segments on which the company is

required to report in their financial statements. Consequently, the determination of the

classification of the business segments, for reporting purposes, is not left to the

discretion of companies' managements but must be made according to the internal

structure of the firm. This type of reporting represents a significant departure from the

traditional accounting reporting regulations, which require uniform measurement and

reporting policies for all companies. The objective of the new standard, and the

deviation from the common reporting practices was "to meet the demand of all those

who make use of financial statements to receive high quality information regarding

companies, in order to make sound investment-related decisions" (FASB, 1997)

SFAS 131 is potentially of great importance in enhancing the information

content of financial reporting, as it requires more detailed information on the different

activities of the firms, but the greater detail may increase data collection costs. The

additional disclosures also impose higher costs on the market participants (investors

and analysts) reviewing them, as the amount of information increases. In addition to

requiring more detailed reporting, it also changed the basis of reporting to a

management-based reporting instead of the traditional reporting standard. One may therefore wonder if the new standards are worth the potential costs and the deviations from the traditional reporting systems.

Prior to the implementation of the new rules, several authors tried to predict the effect of several types of segment reports on investors and firms' behavior (see Arnold, Holder, and Mann, 1980, Balakrishnan, Harris, and Sen, 1990, Boatsman, Behan, and Patz, 1993, Harris, 1998, Hermann and Thomas, 1997, Hopkins, 1996, Maines, McDaniel, and Harris, 1997, Nagarjan and Sridhar, 1996, and Otley and Dias, 1982). After the implementation of the new rules, several studies analyzed their impact on the quality of financial reporting (see Bar-Yosef and Venezia, 2002, Berger and Hann 2003, Ettredge, Kwon, and Smith 2002a, 2002b, Hermann and Thomas, 2000, Street, Nichols, and Gray, 2000, Nichols, Bishop, and Street, 2002, Behn, Nichols, and Smith, 2002). By and large it has been found that as a consequence of the new rules, corporations are reporting higher number of segments than previously, and that the reports they issue are clearer and more detailed.

The objective of this paper is to shed more light on a question not heretofore addressed: would the new reporting system provide more predictive ability than the previous one The ultimate test of the superiority of the new system over the old one is in determining whether "after all is said and done" do investors' forecasts become more accurate due to the new rules. A straightforward way to test this hypothesis would be to compare the accuracy of analysts' predictions prior to 1998 and after it, that is, before and after the adoption of the new reporting rules. Since it is practically impossible to control for all other effects that occurred prior and after the implementation of SFAS 131 (although attempts were made to control for some of them, see Venkataram, 2001), such a test would only be partially accurate. We

therefore propose an experimental approach for tackling this problem in which we could isolate the affect of the change in the reporting rule on the accuracy of predictions.

Investors are often affected by overconfidence (see Barber and Odean, 1999). We therefore investigate whether such a phenomenon exists also in the current study. Although overconfidence would not directly interfere with the usefulness of business segment reporting, overconfidence may sometimes lead to the disregard of information, and in our case, to the overlooking of relevant segment data.

The article is organized in the following manner: in Section II we discuss the method of analysis. In Section III the subjects are described, and in Section IV we review the procedures of the experiment. The results are presented in Section V, and concluding remarks are given in Section VI.

II. Method

We first present, in subsection II.1, a short model that discusses the effect of segment reports on the accuracy of predictions. This model provides some background for understanding the nature of possible advantages and disadvantages of segment reports for forecasting efficiency. In the second subsection we present our experimental method.

II. 1. **Theoretical Model of Segment Reporting Effects on Predictions**

Consider a firm with n segments. Let P_{it} denote the profits of the firm's i^{th} segment.[1] Let P_t denote the total profits of the firm so that:

$$P_t = \Sigma \ P_{it} \tag{1}$$

Assume the investor needs to estimate P_{t+1}, and that

$$P_{i,t+1} = P_{it}(1 + g_{it}) + \varepsilon_{it} \tag{2}$$

where g_{it} is the rate of growth of segment i, and ε_{it} denotes random noise. It then follows that:

$$P_{t+1} = \Sigma \ P_{it}(1 + g_{it}) + \Sigma \ \varepsilon_{it} = \Sigma \ P_{it} + \Sigma \ P_{it} \ g_{it} + \Sigma \ \varepsilon_{it}$$

$$= P_t + \Sigma \ P_{it} \ g_{it} + \ \varepsilon_t \tag{3}$$

where ε_t denotes the sum of the ε_{it} 's.

Let $\hat{P}_{t+1}$ denote the estimate at time t of P_{t+1}. Given segment data this estimate can be given by:

$$\hat{P}_{t+1} \ (\text{segments}) \ = \ P_t + \Sigma \ P_{it} \ g_{it} \tag{4}$$

Without segment reports the estimate at time t of P_{t+1} is given by:

$$\hat{P}_{t+1} \ (\text{no segments}) \ = \ P_t + P_t \ g_t \tag{5}$$

where g_t is the estimate of total profits growth rate, g_t.

The better can the investor estimate the g_{it}'s the more accurate will the estimates of the future total profits be. Segment reports, providing separate data on each segment can theoretically provide better estimates of the future profits since they allow greater detail.

In practice however, there are several factors that may prevent the segment data from yielding better estimates. First, the investor may not use the information. Second, the variation in the g_{it}'s between the segments may be small so that detailed information about each of the segments may be of little consequence. Third, the ε_{it}'s

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[1] The analysis of this subsection is framed in terms of profits, P, but it applies also to any other forecasted variable.

may be negatively correlated so that total profits may be less volatile than the profits of each separate segment and hence, unless the investor takes this into account, using the segment reports may yield worse estimates than using the aggregate data. The efficacy of segment reports depend on all of the above factors, which are not easy to disentangle. We get however some evidence concerning the relative importance of these factors by considering two firms in the analysis, one with smaller and one with larger differences between their segments, and by analyzing to what extent do subjects attach importance to the segment data.[2]

In the following sub-section we present our method for examining the accuracy of predictions.

II. 2. **The Experimental Method**

Subjects were required to play the roles of investors who had to provide prediction of key accounting numbers of a firm (see Appendix A for the exact description of their task). To help them in their forecasts we supplied the subjects with all the relevant public data that would normally be available to investors. The variables they were asked to forecast were: Net Income (NI), Earnings Per Share (EPS), Profit Margin (average), Assets Turnover (average), and Stock Price (average). In each experiment the subjects were divided into two groups. One group received annual financial reports which include SFAS 131 data (New Rules Group, NRG), and the other group, of a similar size and type of subjects, received the reports based on the old business segments reporting rules (Old Rules Group, ORG). In order not to give away the purpose of the experiment, we assigned the two groups different names and told the subjects that they were analyzing different firms. We tried to lead

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[2] These factors are of course related as there is a higher chance the investors will consider the segment reports important if the difference between the segments are considerable.

the subjects to believe that their assignment was a run-of-the-mill forecasting task. In order to disguise the identity of the firm we scaled down all volume and numbers (accounting and other) by a suitable factor, retaining ratios intact.

We employ actual firms and financial reports so as to mimic real life as much as possible. Three experiments were conducted. In Experiments I and II (analyzing "Guess") the subjects differ in their background and occupation but they make predictions for the same firm. In Experiment III (analyzing "Sony") the subjects are similar to those of Experiment I, but they make predictions for a different firm.

Within each experiment we compare the predictions of the NRG to those of the ORG to test for the effect of the new rules. Comparisons between Experiment I and II shed light on the effects of the types of investors groups (professional analysts vs. "market participants"). Comparisons between Experiment I and III help understand the effects of the firms analyzed. We picked Guess at random, where our criterion for choosing this firm was that they changed the number of reported segments from 1 to 3 (Wholesale, Retail, and Concessions) after the introduction of the new rules.[3] We picked Sony since the operating segment information reported under SFAS 131 (provided to the NRG) differs remarkably from that reported under FAS 14 (provided to the ORG). Under FAS 14 the Game business was included in the Electronics segment, but is reported separately under SFAS 131. Under FAS 14 the Music and Pictures businesses were combined in the Entertainment segment, and the

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[3] The New Rules Group analyzing Guess thus received data that are more informative in the strict Blackwell, 1953, sense. Bar-Yosef and Venezia, 2002, have shown that with SFAS 131 firms usually, but not always, provide more informative (in the above sense) reports. Sometimes they provide either the same information as with SFAS 14, or a different partition of the information.

company's financing operations, which were in the Insurance segment, are included in the "Other" segment under SFAS 131.[4]

III. Subjects

Experiment I

Fifty-six fourth year accounting students at the Hebrew University of Jerusalem, aged 24 years or older, participated in the study. Twenty-four were randomly allocated to NRG and thirty-two to ORG. In order to ease the burden of the task, which is quite complicated, the subjects were grouped into teams of two, thus resulting with 12 teams in the NRG and 16 teams in the ORG. During the fourth year of their studies all accounting students at the university (and hence all subjects) prepare for the CPA exams, after graduating with a B.A., and having taken all of the required accounting and finance classes including Financial Statement Analysis course. The subjects were therefore one semester away from becoming CPAs. Few weeks prior to the experiment, they learned in class on both FAS 14 and FASB 131, including the required disclosure and the economic motives for these rules. Thus, the background of the subjects is quite close to that of real financial analysts and in terms of formal education their knowledge may exceed that of most analysts. We therefore believe that the subjects are located at the middle to upper level of the spectrum of capital market sophistication.

Experiment II

Ten analysts, 27 years or older, employed by four different accounting firms or brokerage houses participated in the experiment. They are all experienced analysts,

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[4] Incidentally, the questionable segments reports of Sony in 1994 received major media attention, and provided an impetus for the introduction of SFAS 131.When it was disclosed in November 1994 that Sony's movies business which were then part of the entertainment segment suffered major losses hidden behind the strong performance of Sony's music department, also within the entertainment segment, Sony's stock price fell by 5%.

mostly CPA's with MBA degree, majoring in Finance, with work experience of at least three years.[5]

Experiment III

Sixty two fourth year accounting students at the Hebrew University of Jerusalem similar to those described in Experiment I participated in the study. The experiments were conducted however in different years, and different firms were used in these experiments. Thirty students were assigned to the NRG and 32 to the ORG. As in Experiment I they were required to work in teams of 2, thus giving us 15 teams for NRG and 16 for ORG.

IV. Procedure

In all experiments the data were provided in the form of a questionnaire which detailed the task the subjects had to perform and the incentives to perform well (see Appendix A). We also provided them with accounting and market data that should assist them in their forecasts. We supplied the subjects with previous income statements, balance sheets, and relevant excerpts from the 10K reports. We also provided them with share price history, beta, and some industry highlights. Both groups received the same questionnaire, but the NRG received data which included the supplements on segments as required by SFAS 131, and the ORG received similar data with the exception of not receiving the business segment supplements.

In Experiments I, an independent instructor who is neither the class instructor nor a coauthor of this paper randomly distributed the questionnaires in class and explained the nature of the task at hand. It was promised that the top 1st, 2nd, and 3rd

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[5] It should be noted that the nature of the experiment is demanding in terms of both effort and time. Therefore, firms employing analysts were not always cooperative, as the required input needed to be committed by each analyst to perform the required tasks were not trivial.

teams within each group, in terms of closeness of their results to the true results, will receive cash prizes of $300, $200, and $100, respectively, and that their superior performance will be announced. In addition to the monetary gain, the competitive nature of the students led us to believe that the subjects will make hard efforts to do well. Because of the considerable effort and time required to fulfill the task the subjects were permitted to take the data home and were allowed a week to hand in their results. They were told that collusion is forbidden, and violators will be harshly disciplined.[6] The type of the reward was such that teams had little incentive to cooperate. Experiment III was handled similarly except that we changed the nature of the rewards, providing the top 3 teams extra points towards their grade. These rewards generated similar interest in the experiment as those given in Experiment I.

A similar procedure was used for experiment II with the following differences. First, the questionnaires were sent to the supervisors of the analysts in their work place who in turn explained the task to the subjects. Second, the subjects in this experiment worked individually rather than in teams as this is their typical work setting . They were promised prizes of $500 for the top three performers in each group, and they were also told that their forecasts accuracy ranking will be disclosed. These two incentives led us to believe that the analysts were supposed to do their best[7].

To provide some validation checks and ascertain that the subjects understood the task, we asked them to report the values of the estimated variables for the last two years for which they had data. Since this information appeared in the footnotes and in the auxiliary reports that we provided the subjects, they should have answered these questions correctly if the material was studied carefully. Their answers were generally

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[6] In retrospect, as shall be shown bellow, the large variance of answers points to little or no collusion.
[7] Indeed, the supervisors of these analysts informed us, when the filled questionnaires were turned-in, that each analyst worked for several hours on performing the required tasks.

correct or very close to the actual ones so that we could conclude that the subjects indeed thoroughly read and comprehended the material and understood what their required task was.[8]

To test for overconfidence, the subjects were asked to give 95% confidence intervals for three of the variables forecasted: Net Income, EPS, and Share Price. We then calculated the number of intervals that covered the true values. Since 95% confidence intervals are supposed to cover the true values in 95% of the cases, then, if the provided intervals cover the true values in less than 95% of the cases this may be a sign of overconfidence (see Alpert and Raiffa, 1982). To examine whether the subjects understood what a confidence interval means (although it was explained in class) they were asked to answer the question: "what is the chance the EPS will exceed the upper bound of the 95% confidence interval you suggested for this variable?" Since they provided a 95% confidence interval for EPS, the correct response is 2.5%.

V. Results and Discussion

Experiment I

The predictions of the two groups, the true values of the variables predicted, and the accuracies of the predictions are presented in Tables 1 (for the NRG) and Table2 (for the ORG). We calculated the accuracy as the root mean squared error (RMSE) as follows: for each variable t, predicted by team i, we define the prediction by X_{it}, the true value by P_t, and the error by: [9]

$$\varepsilon_{it} = (X_{it} - P_t) / P_t \tag{6}$$

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[8] For example, out of 28 groups, 19 provided the correct answers to EPS for 1998, 4 groups were within .1 of the correct answer, 3 were within .2 and only one group, that eventually provided the worst estimates gave an incorrect answer.

[9] An additional index for the group (old rules vs. new rules) could be added, but this would unnecessarily complicate the notation.

The accuracy of predictions of team i is then calculated as the root of mean squared errors:

$$\text{RMSE}_i = [(1/T)\Sigma_t \, \varepsilon^2_{it}]^{1/2} \qquad (7)$$

where T is the number of variables forecasted (since there are 5 variables T=5).

The predictions of the teams are presented according to a descending order of accuracy (ascending RMSEi's). The average accuracy of the NRG is 46.25%, and that of the ORG is 49.8%. The accuracies of the two groups seem at first glance quite close, and indeed a t-test could not show a significant difference between them. One observes, however, major differences in the dispersion of the accuracies of predictions within each group. Whereas the RMSEs of the NRG range between 10.67%, and 73.02%, the RMSEs of the ORG range between 28.89% to 66.66%. The new reporting system provides "more information", however the additional data may create an "information overload" on boundedly rational investors. This may lead the NRG to provide on average more accurate but more disperse predictions.

In addition to determining the accuracy of predictions of each analyst we calculated the accuracy of prediction of each variable (averaged over the different analysts). That is, we calculated:

$$\text{RMSE}_t = [(1/N)\Sigma_i \, e^2_{it}]^{(1/2)} \qquad (8)$$

Where N denotes the number of teams (12 for the NRG, and 16 for the ORG).

Descriptive statistics on the RMSE_t s for the NRG and for the ORG are presented in Panels B of Tables 1 and 2, respectively. Differences between the groups are presented in Table 3. The RMSE_t's for the NRG are smaller than their counterparts of the ORG for the following variables: Net Income, Average stock Price, and Asset Turnover, but larger for EPS and Earnings/Sales. The average RMSE

$_t$ over the five variables is smaller for Old Rules Group mainly because of its considerable higher accuracy in the profit margin (Earnings/Sales) variable (9.9% vs. 39.1%). In the other variables (except for EPS where the accuracies were close) the New Rules Group had an advantage.[10]

We also compare the forecasts between groups. Errors in forecasting could be due to some unexpected changes in the financial data that would affect both groups similarly, and hence the size of errors does not implicate any financial data set. However, small or no differences between forecasts between the groups would indicate that the different data sets the groups receive does not matter that much and that the different disclosure rules do not impact the forecasts considerably. To test for this we conduct t-tests for the five variables forecasted (see Table 3). It turns out that for all five variables there are no significant differences between the groups at the 5% level (Net income is higher for the NRG at the 10% level). It appears, therefore, that the additional information provided by the new rules does not have a major effect on the predictions.

To further test the effects of the new rules we also ask the subjects to list the variables that they find to be most useful in their forecasts. Since this question is an open one, we received a great many different variables being labeled important. The variables deemed important most often were the variables usually used in analysis such as profitability, liquidity, sales, previous stock prices, and industry comparable variables. It turned out, however, that only three teams (out of the 12 that received segment reports) listed the segment part as important. [11] One team reported that it used data on each of the segments in its forecasts.

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[10] All variables were underestimated. This however may be due to the nature of the year analyzed where the stock market and Guess performed exceptionally well.

[11] These teams were 11, 14, and 22 of The New Rules Group. They did not do better than the other groups accuracy-wise (See Table 1).

To test for overconfidence the subjects were asked to give confidence intervals for three variables: Earnings, EPS, and Stock Price. Their responses are presented in Tables 4 (NRG), and Table 5 (ORG). In the last column of these tables we record the subjects' answer to the question: "what is the chance the EPS will exceed the upper bound of the 5% confidence interval you suggested for this variable?" As can be observed from this column, only few subjects answered this question right (2.5%), but it seems the subjects had a loose understanding of the notion of confidence intervals. One notes from these tables that only 7% (6 out of 84) of the confidence intervals (marked in bold) cover the true values. Since 95% confidence intervals are supposed to cover the true values 95% of the time and in the present experiment they covered the true values less than 10% of the time, it appears the subjects chose too narrow intervals, possibly as a result of overconfidence.

We also compared the average width of the confidence interval the subjects chose with 2 X Standard Deviation of the variables. Under the assumption of normality, the subjects had to choose roughly such a width, to get the desired confidence interval. The average width the subjects provided was much smaller. The Standard deviation of EPS, share price, and net income of our firm, after adjusting for the scaling factor (1.3 for share price and net income), were: 0.16, 3.28, and 5,107, respectively, implying intervals of 0.32, 6.56, and 10,214. The average confidence widths the subjects chose for these variables were smaller: 0.19, 1.83, and 5,256, respectively.

Experiment II

The results of this experiment, presented in Tables 6-10, are in general quite similar to those of experiment I. We could have aggregated both experiments but we

found there are some insights to be obtained from comparing the different types of subjects.

One notes from Tables 6,7, and 8 that the forecasts of the NRG and the ORG are quite similar. T-tests did not detect any significant difference between the forecasts of the two groups (see Table 8).[12] The overall accuracy of the NRG is somewhat lower than that of the ORG (average RMSE of 34.37% for the ORG vs. 37.32% for the NRG), but this difference is neither statistically nor qualitatively significant. As in Experiment I the subjects were asked to list the variables they used and the variables they considered important. Whereas no subject listed the segment data as important, three out of the five subjects of the NRG reported that they used segment and or sector data. We therefore conclude that in the current experiment as in experiment I, there is no evidence for a significant improvement in forecasts due to the new rules.

Similar to Experiment I the dispersion of the errors in the NRG is higher; the RMSE's ranging in this group between 17.68% and 69.41% compared with RMSE's ranging between 22.93% and 55.2% for the ORG. The subjects in Experiment II were also similar to those in Experiment I in exhibiting overconfidence. As can be observed from Tables 9 and 10, only one confidence interval (marked in bold in Table 10) out of the 30 provided covered the actual variable.

The analysts' forecasts were a little more accurate than those of the students, as they underestimated the variables less than the students (see Table 11 for comparisons between the experiments). The higher overall accuracy is reflected in the lower RMSEs of the analysts as compared with the students (34.37% vs. 46.25% for the NRG, and 34.37% vs. 49.8% for the ORG). Thus whereas we find some

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[12] Due to the small sample size the results of this experiment should be interpreted with caution.

differences in the accuracy of forecasts of Experiments I and II, possibly due to the different types of subjects, the effects of SFAS 131 on the subjects' predictive ability, appears to be similar in both experiments.

Experiment III

The results of this experiment are presented in Tables 12-14.[13] As in the previous experiments the differences between the NRG and the ORG are not striking. The RMSE's of the groups are 41.37% for the NRG, and 32% for the ORG, with a slight advantage for the ORG (see Tables 12 and 13). Another similarity with the previous experiment is the larger dispersion of the RMSE's of the ORG (ranging between 8.6% and 64.8%), and that of the NRG (ranging between 17.29% and 57.44%). There are significant differences between the groups in the estimates of Net Income ($p = 0.00$), Average Stock Price ($p = 0.03$) and a considerable difference, albeit not statistically significant ($p = 0.15$) between their EPS estimates, where the ORG group's average estimates are more accurate (see Table 14). Since the forecasts of the above three variables are correlated (as higher forecasts of Net Income lead to higher estimates of EPS and stock prices) it seems that the overall differences between the groups RMSE's result mainly from differences in their estimated profits. Given that the groups' estimates of the efficiency variables (the asset turnover ratio and the net profit margin) were very close (see Tables 12 and 13), the differences in estimated profits most likely resulted from differences in estimated total sales.

Subjects were also asked to rank the top 4 variables they used in their predictions according to importance (see parts "d" and "e" of Appendix A). The

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[13] We also conducted overconfidence test. Since the results are similar to those obtained for the previous experiments, we prefer not to present the results here to economize space. These results are available from the authors upon request.

results of the rankings are presented in Table 15. As in the previous experiments the segment reports received on average a lukewarm response.

The lower accuracy of the NRG forecasts is surprising. After all, this group received more detailed information than the NRG. They could reconstruct the data the ORG received, and move from there. However, a closer look at the data shows that the extra data may be confusing and may have caused the poorer estimates of the NRG. The variations in the rates of growth of the disaggregated segments is larger than those of the aggregated segments, and this may make the application of the disaggregated model (equation 4 in Section II.1) less accurate than the application of the aggregated model (equation 5 in Section II.1). To see this we present in Table 16, the sales of Sony for the years 1996, 1997, and 1998, and their rates of growth for the years 1997 and 1998.[14] The Disaggregated data, corresponding to SFAS 131, are presented in Panel A and the aggregated data, corresponding to FAS 14, in Panel B. We observe that in 1997 the disaggregated rates of growth, g_i, range between 19.22% and 105.62%, whereas the aggregated g_i's range between only 24.02% and 23.37%. In 1998 the disaggregated g_i's range between 13.52% and 46.66%, whereas the aggregates g_i's range between 18.94% and 29.81%.[15] This higher variability of the disaggregated segments may have contributed to the difficulties in predictions of the NRG.[16]

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[14] Recall that it was previously argued that differences in sales forecasts probably account for the differences in the other variables forecasted.

[15] The effect of SFAS 131 on "Insurance" and "Other Segments" is ambiguous. For one, the financing operations were moved from "Insurance and Finance" under FAS 14 into "Other Segments". Thus, the Insurance segment under SFAS 131 provides a better picture of Sony's insurance operations, but poorer information on the other activities which under SFAS 131 also include financing operations.

[16] One may wonder why is it that in 1994 revelations on Sony's different segments made a huge difference (as reported in a previous footnote), whereas here, in 1998, they had only a little impact. In 1994 however Sony had to disclose information they somehow (deliberately?) managed to keep away from the public, and the new segment information was combined with a huge write-off to Sony's Goodwill.

Why don't investors aggregate the disaggregated data if this may improve the forecasts? Our conjecture is reminiscent of the 1/N theory of Benartzi and Thaler, 2001, who show that the menu of mutual funds provided to the investors affect their choice of risk. A similar bias may also exist here; investors might automatically apply their forecasting model to the data in the format provided to them by the firm.

V. Conclusions

In this article, we test experimentally the information implications on capital market participants of the new business segment reporting requirements SFAS 131. The forecasts obtained based on the new segment disclosure rules, were, marginally more accurate in two of the experiments, but less accurate in the third one, and the measures of accuracies of these forecasts were more disperse for the NRG subjects in all the experiments. These difference may be explained by the type of firm analyzed, where detailed information on diverse segments, as in the case of Sony, may have been more confusing than the aggregated data of former rules. In the case of Guess where the segments are quite similar, the segment reports enabled the subjects to marginally obtain better forecasts. In all the experiments the forecasts under the new rules were not radically different than those based on the old reporting rules.

Our findings therefore indicate that the new reporting rules may have only modest informative benefits over the old ones. Since SFAS 131 led a large number of companies to increase the number of reported business segments, and assuming the costs associated with such disclosures are not trivial, the results of this study cast doubt on whether the information benefits of the new regulations outweigh their costs. Since we experimented with only two sets of firms, the results provided here are not

altogether conclusive. They point however to the need for a broader evaluation of the

information content of SFAS 131 possibly along the lines presented here.

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Table 1

Forecasts, Actual Values and RMSE's of Forecasts
New Rules Group, Students, Guess

Panel A : Forecasts by teams

Team(i)	Net Income	Earnings Per Share	Average stock Price	Asset Turnover Ratio	Net Profit Margin	RMSEi
18	31000	0.94	8.50	2.01	0.46	10.67%
20	29646	0.60	5.60	1.59	0.36	28.23%
12	22364	0.50	6.00	1.78	0.43	32.38%
16	20000	0.60	5.60	1.61	0.34	34.56%
17	17941	0.54	3.20	1.60	0.41	43.06%
15	14400	0.35	5.95	1.80	0.37	43.46%
21	12175	0.28	4.25	1.43	0.40	51.40%
14	11173	0.26	3.53	1.77	0.39	53.43%
13	15000	0.38	4.30	0.56	0.44	54.94%
22	13496	0.31	3.45	1.77	0.04	64.67%
11	13520	0.29	3.40	1.77	0.04	65.17%
19	15066	-0.13	0.32	1.60	0.38	73.02%
Avg. Forecasts	17982	0.41	4.51	1.61	0.34	
Actual Values	39900	0.93	9.00	1.90	0.45	
Average RMSE	46.25%					

Panel B : Summary Statistics of Forecasts by Variable Forecasted

Average	17982	0.41	4.51	1.61	0.34
Std. Dev.	6600	0.26	2.03	0.36	0.14
Median	15033	0.37	4.28	1.69	0.38
Maximum	31000	0.94	8.50	2.01	0.46
Minimum	11173	-0.13	0.32	0.56	0.04
$RMSE_t$	57.2%	61.9%	54.4%	23.8%	39.1%

Table 2

**Forecasts, Actual Values, and RMSE's of Forecasts
Old Rules Group, Students, Guess**

Panel A : Forecasts by teams

Team(i)	Net Income	Earnings Per Share	Average stock Price	Asset Turnover Ratio	Net Profit Margin	RMSEi
1	25540	0.60	5.50	1.74	0.42	28.89%
2	18201	0.55	9.63	1.78	0.49	31.00%
28	14476	0.39	6.63	1.67	0.41	40.95%
4	17500	0.42	4.50	1.75	0.45	41.76%
7	12169	0.32	6.23	1.69	0.47	45.26%
25	11473	0.34	6.03	1.78	0.41	45.30%
9	13500	0.31	6.03	1.30	0.41	46.83%
3	11150	0.32	5.73	1.68	0.40	47.02%
29	12941	0.30	5.50	1.50	0.40	47.32%
10	23000	0.46		1.47	0.36	55.19%
8	13921	0.32	9.19	0.14	0.41	58.67%
5	10500	0.40	0.32	1.68	0.40	60.36%
6	10500	0.40	0.30	1.70	0.40	60.40%
26	11100	0.37	0.35	1.70	0.40	60.48%
27	11933	0.40	5.20	0.15	0.41	60.76%
23	8540	0.22		1.68	0.41	66.66%
Avg. Forecasts	14153	0.38	5.08	1.46	0.41	
Actual Values	39900	0.93	9.00	1.90	0.45	
Average RMSE	49.80%					

Panel B : Summary Statistics of Forecasts by Variable Forecasted

	Net Income	Earnings Per Share	Average stock Price	Asset Turnover Ratio	Net Profit Margin
Average	14153	0.38	5.08	1.46	0.41
Std. Dev.	4692	0.10	2.94	0.53	0.03
Median	12555	0.38	5.62	1.68	0.41
Maximum	25540	0.60	9.63	1.78	0.49
Minimum	8540	0.22	0.30	0.14	0.36
$RMSE_t$	65.5%	59.7%	61.4%	35.4%	9.9%

Table 3

**Inter Groups Differences in Forecasts and RMSEs ,
Students, Guess**

	Net Income	Earnings Per Share	Average stock Price	Asset Turnover Ratio	Net Profit Margin
Average	3828.97[*]	0.03	-0.57	0.14	-0.08
Std. Dev.	1908.25	0.16	-0.91	-0.17	0.11
Median	2478.00	-0.01	-1.34	0.01	-0.02
Maximum	5460.00	0.34	-1.13	0.23	-0.04
Minimum	2633.00	-0.35	0.02	0.42	-0.32
RMSE $_t$	-8.4%	2.3%	-7.1%	-11.6%	29.2%

Notes:
The entries show the differences: new rules group minus old rules group
* p< 0.1

Table 4

Confidence Intervals, New Rules Group, Students, Guess

Panel A: Confidence Intervals

Subject	Net Income Lower Bound	Net Income Upper Bound	EPS Lower Bound	EPS Upper Bound	Share Price Lower Bound	Share Price Upper Bound	Probability of Exceeding interval
18	29500	32500	**0.89**	**0.98**	**8.00**	**9.00**	"Probable"
20	19000	20900	0.40	0.65	5.4	6	9.00%
12	19300	25428	0.42	0.58	5.2	6.8	2.50%
16	18000	21000	0.40	0.65	5.3	5.9	10.00%
17	20400	26320	0.42	0.57	4.9	6.9	NA
15	12300	16500	0.29	0.41	5.7	6.2	17.00%
21	10050	14300	0.23	0.33	4.1	4.4	15.00%
14	8850	13496	0.21	0.31	2.75	6.21	"Low"
13	11000	17000	0.20	0.65	2	8	2.50%
22	11209	15783	0.25	0.37	2.52	6.33	"Minimal"
11	11200	15783	0.25	0.36	2.54	6.23	0.00%
19	11880	26752	-0.15	0.15	0.48	0.87	5.00%

Panel B: Summary Statistics

	Net Income Lower Bound	Net Income Upper Bound	EPS Lower Bound	EPS Upper Bound	Share Price Lower Bound	Share Price Upper Bound	Probability of Exceeding interval
Average	15224	20480	0.317	0.501	4.074	6.070	7.6%
Std dev	6079	6045	0.238	0.222	2.067	1.989	6.2%
Median	12090	18950	0.270	0.490	4.500	6.220	7.0%
Maximum	29500	32500	0.890	0.980	8.000	9.000	17.0%
Minimum	8850	13496	-0.150	0.150	0.480	0.870	0.0%
Average Spread		5256		0.18		2.00	
Actual Values		**39900**		**0.930**		**9**	

Table 5

Confidence Intervals, Old Rules Group, Students, Guess

Panel A: Confidence Intervals

Team	Net Income Lower Bound	Net Income Upper Bound	EPS Lower Bound	EPS Upper Bound	Share Price Lower Bound	Share Price Upper Bound	Probability of Exceeding interval
1	22500	27500	0.52	0.64	2.00	7.00	
2	12128	24292	0.38	0.74	**1.68**	**17.58**	2.50%
28	13328	15543	0.36	0.42	5.83	7.25	5.00%
4	15000	20000	0.38	0.50	3.50	7.00	5.00%
7	7666	16672	0.09	0.55	4.56	7.91	2.50%
25	11187	11759	0.34	0.35	5.88	6.18	2.50%
9	13000	14000	0.28	0.35	5.87	6.18	5.00%
3	7700	16700	0.35	0.55	3.50	7.41	30.00%
29	11731	14151	0.27	0.33	4.30	6.70	1.00%
10	**-66627**	**123400**			**0.00**	**19.56**	"low"
8	11990	17384	0.27	0.41	**3.63**	**9.71**	2.00%
5	15000	20000	0.35	0.45	0.35	0.45	30.00%
6	15000	20000	0.35	0.45	0.30	0.40	25.00%
26	8000	17000	0.34	0.57	3.80	7.90	28.00%
27	11480	17222	0.26	0.41	3.52	5.69	16.00%
23	-11143	18223	0.00	0.43	0.10	2.32	2.50%

Panel B: Summary Statistics

	Net Income Lower Bound	Net Income Upper Bound	EPS Lower Bound	EPS Upper Bound	Share Price Lower Bound	Share Price Upper Bound	Probability of Exceeding interval
Average	6121	24615	0.30	0.48	3.05	7.45	11.2%
Std dev	20590	26623	0.12	0.12	2.08	5.08	12.3%
Median	11861	17303	0.34	0.45	3.51	7.00	5.0%
Maximum	**22500**	**123400**	0.52	0.74	5.88	19.56	30.0%
Minimum	-66627	11759	0.00	0.33	0.00	0.40	1.0%
Average Spread		18494		0.17		4.40	
Actual Values		**39900**		**0.930**		**9**	

Table 6

**Forecasts, Actual Values, and RMSE's of
Forecasts, New Rules Group, Analysts, Guess**

Panel A : Forecasts by Subjects

Subject (i)	Net Income	Earnings Per Share	Average stock Price	Asset Turnover Ratio	Net Profit Margin	RMSEi
1	29000	0.69	8.00	1.80	0.44	17.68%
5	20500	0.62	6.10	1.65	0.47	30.68%
4	20500	0.62	6.00	1.65	0.47	30.92%
2	18600	0.43	5.60	1.90	0.43	37.89%
3	9870	0.29	2.76	3.67	0.40	69.41%
Avg. Forecasts	19694	0.53	5.69	2.13	0.44	
Actual Values	39900	0.93	9.00	1.90	0.45	
Average RMSE's all Subjects	37.32%					

Panel B : Summary Statistics of Forecasts by Variable Forecasted

Average	19694	0.53	5.69	2.13	0.44
Std. Dev.	6812	0.17	1.88	0.87	0.03
Median	20500	0.62	6.00	1.80	0.44
Maximum	29000	0.69	8.00	3.67	0.47
Minimum	9870	0.29	2.76	1.65	0.40
RMSE $_t$	52.9%	45.9%	41.2%	42.7%	6.0%

Table 7

Forecasts, Actual Values, and RMSE's of Forecasts
Old Rules Group, Analysts, Guess

Panel A : Forecasts by teams

Subject (i)	Net Income	Earnings Per Share	Average stock Price	Asset Turnover Ratio	Net Profit Margin	RMSEi
1	26000	0.78	6.00	1.79	0.43	22.93%
5	25000	0.75	4.50	1.80	0.40	29.68%
2	21000	0.48	7.56	1.60	0.44	31.89%
4	21258	0.60	5.48	1.65	0.47	32.14%
3	5290	0.16	6.55	1.85	0.40	55.20%
Avg. Forecasts	19710	0.55	6.02	1.74	0.43	
Actual Values	39900	0.93	9.00	1.90	0.45	
Average RMSE's all Subjects	34.37%					

Panel B : Summary Statistics of Forecasts by Variable Forecasted

Average	19710	0.55	6.02	1.74	0.43	
Std. Dev.	8360	0.25	1.15	0.11	0.03	
Median	21258	0.60	6.00	1.79	0.43	
Maximum	26000	0.78	7.56	1.85	0.47	
Minimum	5290	0.16	4.50	1.60	0.40	
$RMSE_t$	54.0%	47.1%	35.0%	9.7%	7.3%	

Table 8

Inter Groups Differences in Forecasts and RMSEs, Analysts, Guess

	Net Income	Earnings Per Share	Average stock Price	Asset Turnover Ratio	Net Profit Margin
Average	-15.60	-0.02	-0.33	0.40	0.01
Std. Dev	-1547.89	-0.09	0.74	0.76	0.00
Median	-758.00	0.02	0.00	0.01	0.01
Maximum	3000.00	-0.09	0.44	1.82	0.00
Minimum	4580.00	0.13	-1.74	0.05	0.00
RMSE $_t$	-1.1%	-1.2%	6.2%	33.0%	-1.3%

Notes:
None of the differences is significantly different than 0

Table 9

Confidence Intervals by Subjects
New Rules Group, Analysts, Guess

Panel A: Confidence Intervals

	NI		EPS		Share Price		Prob. of EPS
Subject	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Exceeding interval
1	26000	32000	0.64	0.715	7.40	8.50	5.00%
5	17000	25000	0.52	0.76	5.2	6.8	3.50%
4	16500	24000	0.50	0.727	5	7	2.50%
2	18135	19065	0.42	0.44	5.46	5.74	2.50%
3	9000	9870	0.27	0.3	2.39	3.14	25.00%

Panel B: Summary Statistics

	NI		EPS		Share Price		Prob. of EPS
Average	17327	21987	0.470	0.588	5.090	6.236	7.7%
Std. Dev.	6042	8197	0.14	0.21	1.79	1.99	9.7%
Median	12090	18950	0.34	0.45	3.521	6.8	5.0%
Maximum	26000	32000	0.640	0.760	7.400	8.500	25.0%
Minimum	9000	9870	0.270	0.300	2.390	3.140	2.5%
Avearge Spread		4660		0.12		1.15	
Actual Values		**39900**		**0.930**		**9**	

Table 10

Confidence Intervals by Subjects
Old Rules Group, Analysts, Guess

Panel A: Confidence Intervals

	NI		EPS		Share Price		Prob. of EPS Exceeding interval
Subject	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound	
1	24700	27300	0.74	0.82	5.70	6.30	20%
5	10000	35000	0.30	1.00	3.00	6.50	na
2	10000	30000	0.30	0.90	**3.00**	**18.00**	2.50%
4	17358	26743	0.42	0.68	4.30	6.10	2.50%
3	5000	10000	0.15	0.30	3.00	7.00	7.50%

Panel B: Summary Statistics

	NI		EPS		Share Price		Prob. of EPS Exceeding interval
Average	13412	25809	0.38	0.74	3.80	8.78	8.1%
Std. Dev.	7698	9422	0.22	0.27	1.20	5.16	8.3%
Median	11975	22994	0.32	0.46	3.52	6.40	5.0%
Maximum	24700	35000	0.74	1.00	5.70	18.00	20.0%
Minimum	5000	10000	0.15	0.30	3.00	6.10	2.5%
Average Spread		12397		0.36		4.98	
Actual Values		**39900**		**0.93**		**9**	

Table 11

Differences in Average Forecasts Between Analysts and Students, Guess

	Net Income	Earnings Per Share	Average stock Price	Asset Turnover Ratio	Net Profit Margin
Average, NRG Students	17982	0.41	4.51	1.61	0.34
Average, NRG Analysts	19694	0.53	5.69	2.13	0.44
Difference	-1712	-0.12	-1.18	-0.53	-0.11**
Average, ORG Students	14153	0.38	5.08	1.46	0.41
Average, ORG Analysts	19710	0.55	6.02	1.74	0.43
Difference	-5557	-0.17	-0.94	-0.27*	-0.01

** $p < 0.05$, * $p < 0.10$

Table 12

Forecasts, Actual Values and RMSE's of Forecasts
New Rules Group, Students, Sony

Panel A : Forecasts by teams

Team(i)	Net Income	Earnings Per Share	Average stock Price	Asset Turnover Ratio	Net Profit Margin	RMSEi
524	1400	3.000	71.500	1.020	0.330	17.29%
512	1106	2.340	63.100	1.161	0.210	32.44%
525	824	2.153	62.163	1.136	0.374	35.30%
511	750	2.110	65.000	1.100	0.335	35.56%
510	818	2.150	63.293	1.078	0.418	36.91%
525	814	2.110	61.465	1.110	0.419	37.63%
509	1000	2.200	64.370	1.000	0.160	37.97%
527	700	1.808	78.000	1.095	0.227	39.25%
507	1519	0.586	76.816	1.170	0.283	39.83%
515	1368	0.535	71.205	0.950	0.303	41.20%
508	1077	2.800	65.110	0.970	0.066	43.62%
522	568	1.420	64.250	0.960	0.247	45.03%
518	1700	0.630	79.000	1.170	0.080	51.11%
503	1478	7.150	59.600	0.099	0.250	54.43%
1200	1550	3.360	79.000	1.050	0.720	56.93%
501	319	0.841	43.340	1.178	0.229	57.44%
Average Forecast	1062	2.20	66.70	1.02	0.29	41.37%
True Values	1708	4.20	87.45	1.06	0.32	
Average RMSE	41.37%					

Panel B : Summary Statistics of Forecasts by Variable Forecasted

Average	1062	2.20	66.70	1.02	0.29
Std. Dev.	404	1.58	9.17	0.26	0.15
Median	1039	2.13	64.69	1.09	0.27
Maximum	1700	7.15	79.00	1.18	0.72
Minimum	319	0.54	43.34	0.10	0.07
$RMSE_t$	44.2%	59.9%	25.8%	23.8%	47.6%

Table 13

Forecasts, Actual Values, and RMSE's of Forecasts
Old Rules Group, Students, Sony

Panel A : Forecasts by teams

Team(i)	Net Income	Earnings Per Share	Average stock Price	Asset Turnover Ratio	Net Profit Margin	RMSEi
413	1855	4.780	78.940	1.065	0.310	8.6%
417	1411	3.520	69.440	0.936	0.310	15.0%
412	2093	3.200	82.170	1.106	0.260	17.2%
401	1508	3.025	66.800	1.025	0.295	17.6%
403	2159	5.500	80.699	1.025	0.314	18.6%
841	1477	3.511	59.603	0.903	0.256	20.4%
427	2267	5.900	78.440	1.330	0.340	26.6%
409	2737	4.530	76.820	1.140	0.283	28.4%
424	2188	6.500	77.400	1.100	0.190	33.4%
405	1970	4.780	76.820	1.324	0.084	36.5%
415	1406	0.550	78.040	1.199	0.330	40.4%
407	1700	0.610	86.000	0.920	0.100	49.4%
418	1550	0.560	76.800	0.950	0.090	51.0%
422	373	0.960	56.979	1.026	0.270	52.0%
421	611	0.140	62.703	0.913	0.061	64.8%
Average	1687	3.20	73.84	1.06	0.23	32.00%
True Values	1708	4.20	87.45	1.06	0.32	
Average RMSE	32.00%					

Panel B : Summary Statistics of Forecasts by Variable Forecasted

Average	1687	3.20	73.84	1.06	0.23
Std. Dev.	616	2.16	8.65	0.14	0.10
Median	1700	3.51	76.82	1.03	0.27
Maximum	2737	6.50	86.00	1.33	0.34
Minimum	373	0.14	56.98	0.90	0.06
RMSE $_t$	34.9%	55.1%	18.3%	12.7%	40.7%

Table 14

Inter Groups Differences in Forecasts and RMSEs , Students, Sony

	Net Income	Earnings Per Share	Average stock Price	Asset Turnover Ratio	Net Profit Margin
Average	-625.22	-1.00	-7.14	-0.05	0.06
Std. Dev.	-212.92	-0.59	0.52	0.12	0.05
Median	-661.45	-1.38	-12.14	0.06	0.00
Maximum	-1037.48	0.65	-7.00	-0.15	0.38
Minimum	-54.01	0.40	-13.64	-0.80	0.00
RMSE $_t$	9.3%	4.8%	7.5%	11.1%	7.0%
P-Value	0.00	0.15	0.03	0.51	0.22

Notes:
The entries show the differences: new rules group value minus old rules group

Table 15

Sony, NRG, Ranking of Top 4 Variables in Terms of their Importance

Sony, NRG, Ranking of Top 4 Variables in Terms of
their Importance

Total Sales	1
Cost of goods sold	2
Net income	3
Past Stock prices	4
ROE	5
ROA	6
Industry reports	7
Segment Sales	8
Liquidity	9
Net segment profits	10

Note: The subjects had to choose the top 4 variables in terms of their importance, and
then rank each of those four in order of importance 1-10

Table 16

Sales of Sony (yen in Millions), and Rates of Growth for the Years 1997, 1998
According to SFAS 131 (Panel A), and FAS 14 (Panel B)

	Sales			Rates of growth	
	1996	1997	1998	1997	1998
Panel A					
Disaggregated Segments (SFAS 131)					
Electronics	3,465,456	4,131,631	4,690,110	19.22%	13.52%
Games	203,911	419,278	722,551	105.62%	72.33%
Music	517,835	592,080	694,714	14.34%	17.33%
Movies	317,580	438,554	643,164	38.09%	46.66%
Average of the above segments	1,126,196	1,395,386	1,687,635	44.32%	37.46%
Range of the above segments	3,261,545	3,712,353	4,046,946	91.28%	58.82%
Insurance	206,903	227,934	291,068	10.16%	27.70%
Total	4,711,685	5,809,477	7,041,607	23.30%	21.21%
Panel B					
Aggregated Segments (FAS 14)					
Electronics including games	3,669,367	4,550,909	5,412,661	24.02%	18.94%
Entertainment (Movies and Music)	835,415	1,030,634	1,337,878	23.37%	29.81%
Average of the above segments	2,252,391	2,790,772	3,375,270	23.70%	24.37%
Range of the above segments	2,833,952	3,520,275	4,074,783	0.66%	10.88%
Insurance	206,903	227,934	291,068	10.16%	27.70%
Other	273,975	240,374	248,229	-12.26%	3.27%
Total	4,711,685	5,809,477	7,041,607	23.30%	21.21%

Note: The averages of the rates of growth are not value weighted.

Appendix A

Questionnaire

The date is April 1, 1999.[17] Assume you are an analyst in the big investment bank "Investronics", and you were assigned to analyze the firm "NRG", specifically, your supervisor asked you to provide forecasts of the financial performance of NRG for 1999. These forecasts usually go to the trading department of Investronics , where they use the forecasts either for trade or for recommendations to clients.

To help you in the task you will receive the following documents:

1. Select qualitative data from the annual reports of NRG for 1997, 1998.

2. Select quantitative reports from NRGs's annual reports from 1997, 1998

3. Relevant Industry and macroeconomic data.

You are supposed to use the auxiliary documents to perform the forecasts.

It is extremely important to provide accurate forecasts. Your forecasts will be compared to the actual variables, when these will become known. Your accuracy will then be compared to that of other teams who have been assigned a similar task. Each team that will fill the questionnaire will receive a nominal amount of cash for its work. In addition the six teams whose forecasts will be closest to the actual variables, will receive a $100 prize.

The forecasts should be handed in to the simulation coordinator within a week from today.

The following describe your task in detail:

a. Based on the supplements you were given, please answer the following:

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[17] In the case of Sony all periods are one year earlier.

1. What was the gross profit per share in 1997 and 1998? (In $)

2. What was the Return on Equity (ROE) in 1997, and 1998? (in %)

3. What was the Return on Assets (ROA) in 1997, and 1998?(in %)

4. Which segment has been most profitable in 1997? In 1998? Explain

b. Provide the following forecasts (please use the enclosed Tables):

1. Total after tax earnings for 1999 (in $1000)

2. Per share earnings for 1999 (in $)

3. Average Stock Price in 1999 (in $)

4. Ratio of Sales/Assets (in %, 1999 average)

5. Profits/Sales (in %, 1999 average)

6. A confidence interval for the total net earnings of the firm (that is a range of profits such that there are 95% chances that actual profits will fall in this range)

7. A confidence interval for firm's EPS.

8. A confidence interval for firm's average stock price.

c. Explain shortly how you got your forecasts;

1. Which statistical methods did you use?

2. Which economic models did you use?

3. Which variables did you use in your calculations (please list all)

4. Which variables were the most important? (select 4)

5. What is the chance that the actual profit will exceed the upper bound supplied for b-6 above?

The following questions were asked only for Sony:

d. Rank the following variables in order of importance in your forecasts (in a scale of 1-10, 1 being the most important)

ROA
Past Stock prices
Segment sales
Total sales
Liquidity ratios
Industry reports
Net segment profits
Net profits
ROE
Costs of goods sold
Segment cost of goods sold

e. Rank in a scale of 1-10 the 4 variables you designated as most important in the question above.