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Abstract

Thomas (1999) documents that investors discount the value of foreign earnings for U.S. multinationals. He conjectures but does not test the possibility that this finding is due to poor disclosure related to foreign operations. In this paper, we investigate whether the market's valuation of foreign earnings is a function of the firm's geographic segment disclosures. Specifically, we examine the effects of (1) the introduction of SFAS 131, (2) the change in the number of geographic segments disclosed, and (3) the inclusion of performance measures in geographic segment disclosures. We find strong evidence that our proxies for increased disclosure are positively associated with the foreign earnings response coefficient (FERC). In addition, we use the Mishkin (1983) test and find that investors' mispricing of the foreign component of earnings lessens (and in fact disappears) with greater disclosure related to foreign operations. Taken together, our results suggest that the pricing of foreign earnings is associated with important aspects of the firm's information environment.

Keywords: foreign earnings, geographic disclosures, valuation, market mispricing

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1. INTRODUCTION

This study investigates investors' pricing of foreign earnings of U.S. multinational firms. We relate the pricing of foreign earnings to certain aspects of Statement of Financial Accounting Standards No. 131 (SFAS 131), which changes the way in which many multinational firms report their geographic segment information. Specifically, we first examine whether the overall adoption of Statement of Financial Accounting Standards No. 131 (SFAS 131) affects the pricing of foreign earnings. We then test whether cross-sectional differences in geographic segment disclosures *post* SFAS 131 relate to the pricing of foreign earnings. Examining the pricing of earnings components is of interest to both practitioners and academics because of the potential for investors to more precisely forecast earnings and estimate firm value (Khurana, Pereira, and Raman 2003; Lipe 1986; and others). Foreign operations can experience profitability, growth, and risk patterns that differ significantly from those of domestic operations (Bodnar, Hwang, and Weintrop 2003). Consequently, both the Financial Accounting Standards Board (FASB) and the Securities and Exchange Commission (SEC) mandate the disclosure of information relevant for assessing firms' foreign operations.

Research has examined how investors value the foreign versus domestic components of earnings and whether geographic segment disclosures are useful to investors. Boatsman, Behn, and Patz (1993) examine whether equity valuations of U.S. multinationals are affected by SFAS 14 mandated geographic segment income disclosures. For the most part, the authors conclude that there is little evidence that SFAS 14 geographic segment income disclosures are used by investors. Bodnar and Weintrop (1997) split earnings into their domestic and foreign components using SEC mandated disclosures (SEC Regulation §210.4-08(h)). They document that both foreign and domestic earnings changes are significantly positively associated with annual excess

stock returns and that the coefficient on foreign earnings is significantly larger than the coefficient on domestic earnings. They attribute their finding to greater growth opportunities in foreign markets. Consistent with these findings, Thomas (1999) documents that foreign earnings are more persistent than are domestic earnings. He also shows, however, that stocks are (temporarily) mispriced relative to the firm's current change in foreign earnings. He conjectures, but does not test, the possibility that this finding may be explained by poor disclosure of foreign operations. In other words, investors cautiously discount the value of the foreign earnings streams, which seems plausible given the relatively poor disclosure of foreign operations provided by many firms (e.g., White, Sondhi, and Fried 2003, 577).

Prior theoretical research provides several reasons why low-quality disclosures can have an adverse effect on the valuation of a firm's earnings. First, low-quality disclosures increase the information asymmetry component of the cost of capital because investors tend to discount the value of stocks for which limited information is available (Leuz and Verrecchia 2000). The information asymmetry could arise either between the firm and investors or among investors (e.g., Francis et al. 2004). Regarding information asymmetry between the firm and investors, Leuz and Verrecchia (2005) show how poor quality disclosure creates information risk. Investors anticipate this and demand a higher risk premium (i.e., they charge a higher cost of capital). Regarding information asymmetry among investors, Easley and O'Hara (2004) show that, in a model with informed and uninformed investors, the information risk faced by the uninformed investors is not diversifiable and will therefore be priced. The information risk is reduced with the precision of firm disclosure. Regardless of its source, if information asymmetry is especially severe for foreign operations (as the extant literature suggests), then the risk-adjusted discount rate for foreign earnings should decrease when the information environment improves.

Second, when the amount or quality of publicly available information about a firm is low, investors must undergo the cost of gathering and processing private information. This additional cost will increase investors' required return. As the firm's information environment improves, investors' information acquisition cost is reduced because they can now free-ride on the information that the firm produces (e.g., Diamond 1985). The more the firm discloses the more investors free-ride. Thus, an improvement in geographic segment disclosures should reduce investors' private information search costs related to foreign earnings, reducing the expected return.

Third, Holthausen and Verrecchia (1988) suggest that the price reaction to the release of information is negatively related to the noisiness of the information signal. If geographic disclosures provide a noisy set of information about valuation-relevant future cash flows, then price changes associated with a given amount of unexpected foreign earnings will be smaller. To the extent that improved geographic disclosures can reduce the noise in foreign earnings, the price response to unexpected foreign earnings should increase.[1]

Consistent with Bodnar and Weintrop (1997), we find that both domestic and foreign earnings are value relevant. More importantly, we find strong evidence that our proxies for increased disclosure are positively associated with the foreign earnings response coefficient (FERC hereafter). That is, (1) time-series tests show that FERC increases with the introduction of SFAS 131, (2) cross-sectional tests show that FERC increases with increased geographic segment disaggregation post SFAS 131, and (3) cross-sectional tests show that FERC increases

[1] Collins and Salatka (1993) test the model of Holthausen and Verrecchia (1988) following the adoption of SFAS 52 by multinational firms. SFAS 52 was meant to improve foreign currency accounting compared to that under SFAS 8. They find that the response to unexpected earnings increases after implementation of SFAS 52, suggesting that investors perceive earnings under the new standard to be a less noisy measure of future cash flows.

with the inclusion of earnings in geographic segment disclosures post SFAS 131.[2] Our findings are robust to alternative sample designs and to a number of sensitivity tests, including controls for extent of foreign operations, differential growth rates between domestic and foreign operations, firm size, profitability, structural changes related to mergers and acquisitions, internal growth or divestitures, and self-selection biases. In addition, we conduct Mishkin (1983) tests to examine whether the investor mispricing documented by Thomas (1999) is mitigated with greater geographic disclosure. Results of these tests indicate that investors' mispricing lessens (and in fact disappears) with the introduction of SFAS 131. Taken together, our results suggest that the pricing of foreign earnings is associated with important aspects of the firm's information environment.

We contribute to the existing literature in several ways. First, we provide further empirical support for the usefulness of SFAS 131 disclosures. In particular, we interpret our results as evidence that such disclosures enhance the relevance of foreign earnings numbers. As U.S. companies are becoming increasingly multinational, an understanding of their foreign operations is essential to investors, and useful disclosure of this information is of interest to standard setters. Second, by providing evidence of a positive relation between the voluntary inclusion of earnings in geographic segment disclosures and the pricing of foreign earnings, we help inform the ongoing debate on whether such disclosures should be mandated.[3] As discussed in more detail below, geographic earnings disclosures mandated by SFAS 14 are no longer required under SFAS 131 for many firms. In addition, our Mishkin test provides support for the claim that additional disclosures can reduce market mispricing. This study is one of the first

[2] In this paper, we use the terms "earnings" and "performance measures" interchangeably.

[3] Since we do not consider costs that would be imposed on the firm if such disclosures were mandated, we are not able to conclude that mandating these disclosures would increase social welfare. Admati and Pfleiderer (2000) discuss conditions under which requiring firms to disclose information improves social welfare.

attempts to show that improved disclosure reduces mispricing. Such retesting of market mispricing based on changes in disclosure has a wide variety of applications in the accounting literature.

The remainder of the paper is organized as follows. In the next section we provide background on segment disclosures and develop our hypotheses. Section 3 defines the earnings and abnormal stock return variables we use, describes the sample selection, and provides descriptive statistics. The empirical results are provided in Section 4, and Section 5 concludes.

2. BACKGROUND AND HYPOTHESES DEVELOPMENT

In this section, we first discuss the changes in the firm's disclosure brought about by SFAS 131. We then present our hypotheses related to how both mandatory changes in geographic segment disclosure following SFAS 131 and firms' voluntary segment disclosure choices are associated with the pricing of foreign earnings.

2.1 Background on SFAS 131

SFAS No. 131 (Disclosures about Segments of an Enterprise and Related Information) became effective for fiscal years beginning after December 15, 1997 (FASB 1997). It superseded SFAS 14 (Financial Reporting for Segments of a Business Enterprise) which had come under severe criticism from various user groups. Perhaps most importantly, the CFA Institute (formerly the Association for Investment Management and Research or AIMR) issued a position paper in 1993 requesting that financial statement information be disaggregated to a much greater degree and more information be provided for segments (AIMR 1993).[4] Similarly, the AICPA Special

[4] Paragraph 45 of SFAS 131 includes the following statement: "There is no disagreement among AIMR members that segment information is totally vital to their work. There also is general agreement among them that the current

Committee on Financial Reporting (1994) listed improved segment information as its number one recommendation.

Firms were required to disclose segment information under SFAS 14 by both line-of-business and geographic area with no specific link to the internal organization of the company. SFAS 131 fundamentally changes the manner in which firms provide segment information (Herrmann and Thomas 2000). The standard requires companies to report disaggregated information about reportable operating segments based on management's organization of the enterprise (the "management approach"). An operating segment is defined as a component of an enterprise (1) that engages in business activities from which it may earn revenues and incur expenses, (2) whose operating results are regularly reviewed by the enterprise's chief operating decision maker, and (3) for which discrete financial information is available (SFAS 131, paragraph 10). Under SFAS 131, operating segments may be based on products and services, geographic location, legal entity, customer type, or another basis. For each operating segment, firms must provide information about segment profit or loss, certain revenue and expense items, and assets. In addition, SFAS 131 requires supplemental "enterprise-wide disclosures" about products and services, geographic areas, and major customers if they are not already included as part of the operating segment disclosures. For companies that do not define operating segments on the basis of geographic location, SFAS 131 requires the disclosure of revenues from external customers and long-lived assets for each material country.[5] This represents a major difference

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segment reporting standard, Financial Accounting Standard No. 14, is inadequate." Likewise, Epstein and Palepu (1999) report that many sell-side analysts consider segment disclosures as the most useful data for their investment recommendations.

[5] Materiality is not specifically defined for enterprise-wide disclosures. According to Herrmann and Thomas (2000), many companies use 10% as a threshold. Doupnik and Seese (2001), however, find that many firms use quantitative thresholds less than 10%. In addition to providing information by individual material country, SFAS 131 indicates that "an enterprise may want to provide subtotals of geographic information about groupings of countries" (paragraph 38).

from SFAS 14, under which firms were allowed to disclose geographic information by geographic region. Many users complained that the regional disclosures were of limited use.

Street, Nichols, and Gray (2000) report that the consistency of segment information and the number of total segments reported increased significantly with the introduction of SFAS 131.[6] Based on these findings, the authors conclude that business reporting improved with SFAS 131. Berger and Hann (2003a) and Herrmann and Thomas (2000) report similar findings. Herrmann and Thomas (2000) also document that for enterprise-wide disclosures, the proportion of country-level geographic segments has increased, while the proportion of broader geographic area segment disclosures has decreased. However, unlike SFAS 14 which required disclosure of geographic earnings, SFAS 131 does not mandate the disclosure of earnings by geographic area when the firm defines operating segments along industry lines. As a result, Herrmann and Thomas (2000) and Street et al. (2000) find that relatively few companies voluntarily disclose profit by geographic area under SFAS 131. In addition, for those firms that choose to include earnings in their geographic segment disclosures, SFAS 131 does not define which measure of segment profit or loss should be used. Rather, it allows any measure to be reported as long as that measure is used internally for decision making. Hence, there is some mixed evidence regarding the potential usefulness of geographic segment disclosures following SFAS 131. In the next section, we introduce hypotheses related to whether SFAS 131 disclosures relate to the pricing of foreign earnings.

[6] Similarly, a 1998 report by Bear Stearns emphasizes the improvement in the consistency of descriptions of the business throughout the president's letter, management discussion and analysis, and notes.

2.2 Hypotheses development

Investors and analysts often assert that segment disclosures are among the most important information provided by firms. For example, in a recent CFA Institute survey ("Global Corporate Financial Reporting Quality," October 27, 2003), 71% of investment professionals rated segment disclosures as either "very" or "extremely" important. Prior research finds that, under certain conditions, geographic segment disclosures potentially enhance predictability of consolidated amounts (e.g., Balakrishnan, Harris, and Sen 1990; Nichols, Tunnell, and Seipel 1995; Herrmann 1996). However, user groups complained that firms' disclosure practices under SFAS 14 were inadequate and research has shown that investors did not use SFAS 14 geographic segment earnings disclosure in valuing securities (Boatsman et al. 1993).

Given firms' low-quality disclosures under SFAS 14, investors may have cautiously discounted the value of foreign earnings (Thomas 1999; Khurana et al. 2003; Callen, Hope, and Segal 2005). If geographic segment disclosures under SFAS 131 represent an improvement to investors in forecasting future earnings and hence valuing the firm more accurately, then the valuation discount applied to foreign earnings should decrease in the level of such disclosure.[7,8] We present several related hypotheses (all stated in the alternative form). Our hypotheses examine whether the valuation of foreign earnings relates to geographic segment disclosures. Specifically, we consider whether the valuation of foreign earnings varies with the introduction of SFAS 131, with the change in the number of geographic segments following SFAS 131, and

[7] Prior research has examined the role of enhanced disclosure in reducing estimation risk (where estimation risk is triggered by information asymmetry) and concludes that greater disclosure may reduce estimation risk and that this risk is non-diversifiable (e.g., Barry and Brown 1985; Handa and Linn 1993; Coles, Loewenstein, and Suay 1995; Easley and O'Hara 2004). Improved disclosure may also reduce the noise related to forecasting future earnings, thereby increasing the response to unexpected earnings (Holthausen and Verrecchia 1988).

[8] Ettredge et al. (2005) find that firms' adoption of the segment disclosure requirements contained in SFAS 131 is associated with an increase in the stock market's ability to predict the firm's future earnings.

with the inclusion or exclusion of performance measures in geographic segment disclosures following SFAS 131.

Consistent with prior literature which suggests that SFAS 131 potentially improves geographic segment reporting (e.g., Street et al. 2000; Herrmann and Thomas 2000; Behn, Nichols, and Street 2002), investors may now assess the company "through the eyes of management." Related to this, our first hypothesis investigates whether the overall impact of adopting SFAS 131 affects the valuation of foreign earnings:

H1: FERC is higher after adoption of SFAS 131.

Not all firms increased their number of reported geographic segments following SFAS 131, and some even reduced the number of geographic segments (e.g., Herrmann and Thomas 2000). Segment information provided at a less aggregated level should be at least as useful as that provided at a more aggregated level.[9] Therefore, an increase in the number of segments should result in higher-quality disclosures. The second hypothesis examines in the post-SFAS 131 period whether firms that increased their reported number of geographic segments after adoption of SFAS 131 have a higher FERC compared to firms that had no increase:[10]

[9] This is an application of the fineness (or Blackwell) theorem from information economics. Briefly, the theorem states that the information in X is preferred to the information in Y as long as every signal from X is fully contained in a signal from Y (e.g., Demski 1977). For example, Piotroski (2003a) finds that segment reporting fineness is negatively associated with information asymmetry about future earnings realizations. There are conditions under which the fineness theorem, however, may not hold. For example, if segment data are measured or reported with error, decisions using the finer data need not be as accurate as decisions using consolidated data alone (e.g., Givoly, Hayn, and D'Souza 1999).

[10] Given that SFAS 131 changed not only the number of reported segments but also the definition of segments, it is conceivable that for some firms (and under certain circumstances), a decrease in reported segments could in fact yield a more informative system. However, we would consider this to be the exception rather than the rule. The prime intent of SFAS 131 was for firms to *disaggregate* their segment information (e.g., Ettredge et al. 2005; FASB 1997). In addition, as described above, both the AICPA Special Committee (AICPA 1994) and the AIMR committee (AIMR 1993) explicitly called for more detailed segment information (i.e., more disaggregated information). This suggests that both standard setters and user groups view segment disaggregation as useful for investors.

H2: In the post-SFAS 131 period, FERC of firms that increase the number of reported geographic segments is greater than FERC of firms that do not increase the number of reported geographic segments.

As discussed previously, another notable change of SFAS 131 is the lack of a requirement for the disclosure of earnings for enterprise-wide geographic segments. Only revenues and assets are required disclosures. Although not the only factor, earnings are the single most important explanation of firms' stock returns over the long run and a significant determinant even in the short run (e.g., Givoly, Hayn, and D'Souza 1999). Therefore, consistent with prior research that links disclosure quality with the ability of financial analysts and investors to predict firm performance (e.g., Lang and Lundholm 1996; Lundholm and Myers 2002; Gelb and Zarowin 2002), we expect investors to face reduced uncertainty by having access to earnings reported by geographic segment. Hence, we expect FERC to increase in the disclosure of geographic earnings:

H3: In the post-SFAS 131 period, FERC of firms that include performance measures in geographic segment disclosures is greater than FERC of firms that do not include performance measures in geographic segment disclosures.

H1-H3 test whether FERC is increasing in geographic segment disclosures. Results supporting these hypotheses would be consistent with conclusions in Aboody, Hughes, and Liu (2002). They show that when mispricing occurs, earnings response coefficients are biased downwards. As investors' mispricing diminishes, the current returns/current earnings relation increases and ERCs will be higher. Thus, finding a higher FERC with improved geographic disclosures is consistent with reduced mispricing of foreign earnings. As a final hypothesis, we

directly test for the mispricing of foreign earnings around adoption of SFAS 131 using the Mishkin (1983) test:

H4: Investors' mispricing of foreign earnings is mitigated by the adoption of SFAS 131.

3. VARIABLE DEFINITIONS AND SAMPLE SELECTION

In this section, we describe how we compute the earnings and abnormal stock return variables. We then explain our sample selection and discuss descriptive statistics.

3.1 Earnings measures

The SEC mandates the disclosure of pre-tax earnings and taxes for both domestic and foreign operations. Using the Compustat Annual database (both active and research firms), we compute foreign earnings as pretax foreign income (#273) adjusted for foreign taxes where foreign taxes are measured as the sum of foreign income taxes (#64) and deferred foreign taxes (#270). Domestic earnings are the difference between pretax domestic income (#272) and domestic taxes (total income taxes (#16) less foreign taxes). We then compute earnings changes by differencing the earnings measures. To facilitate cross-sectional and temporal comparisons, we standardize the foreign and domestic earnings changes by stock price at the beginning of the fiscal year.[11]

[11] Inferences are not affected if we instead scale by lagged or average total assets.

3.2 Abnormal stock return measure

We follow a procedure similar to Bodnar and Weintrop (1997) to compute abnormal stock returns. We extract stock returns inclusive of dividends from the CRSP monthly returns file. If the firm is delisted during a specific month, we use the delisting return provided by CRSP, if it is available. To compute annual abnormal returns for the current fiscal year, we proceed as follows. First, we require that 36 monthly returns preceding the current fiscal year are available to estimate the market model parameters. The market model is estimated using CRSP value-weighted market returns. Second, we cumulate the monthly returns starting the fourth month after the previous fiscal year end month and ending three months after the termination of the current fiscal year:

$$UR_{it} = \prod_{j=1}^{12} (1 + (R_{i,j} - \hat{\alpha}_i - \hat{\beta}_i R_{m,j})) - 1.$$

UR is the current cumulative abnormal annual return, $R_{i,j}$ is the raw monthly return for firm i month j, $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the firm-specific parameters of the market model estimated over the previous 36 months, and $R_{m,j}$ is the CRSP value-weighted monthly market return corresponding to month j.[12]

3.3 Sample selection and descriptive statistics

Our sample period spans the period from 1985 to 2002 and the sample selection procedures follow Bodnar and Weintrop (1997). We include only firms incorporated in the

[12] As alternative specifications we have used (1) raw returns, (2) value-weighted market-adjusted returns, and (3) size-adjusted returns. We have also required 60 months of returns for the market model estimation. Results are similar with these alternative specifications of annual returns.

United States with both current and lagged observations for domestic and foreign pre-tax annual income. We also require that data are available for current and lagged income taxes. These restrictions yield a sample of 17,676 firm-year observations (2,805 firms). Requiring stock returns from CRSP reduces the sample to 14,972 observations (2,476 firms). After imposing necessary requirements on the availability of stock returns in order to compute the market model parameters, we have a sample of 11,503 observations (1,939 firms). Finally, in order to ensure that our results are not driven by extreme observations, we eliminate the top and bottom half percentile of standardized domestic and foreign earnings changes. After imposing these data constraints the final sample for the earnings response coefficient tests of H1 consists of 11,328 observations (1,925 firms). For tests of H2 and H3, we have a total of 3,663 observations (1,211 firms) for the post-SFAS 131 period.[13] Panel A of Table 1 summarizes our sample selection procedures. Panel B shows that approximately 24% of the sample firms increase the number of geographic segments and 35% include at least one performance measure in the geographic segment disclosure when they adopt SFAS 131.

Panel A of Table 2 presents descriptive statistics for the pre- and post-SFAS 131 periods. As sample firms are multinationals, they are relatively large, with a median (mean) market value of equity of $338 million ($2.5 billion) for the pre-SFAS 131 period and $582 million ($3.8 billion) for the post-SFAS 131 period. By comparison, the median (mean) market value of all Compustat firms for the entire sample period is $70 million ($1.2 billion). Foreign revenues as a percent of total revenues have median values of 26% and 35% in the pre and post period, respectively, illustrating the importance of foreign operations for the average sample firm. As in Bodnar and Weintrop (1997), the median growth rate of foreign sales exceeds that of domestic

[13] Specifically, if a firm has December fiscal year end, then the post-SFAS 131 period starts with fiscal year 1998, otherwise the post period starts with fiscal year 1999. Our post-SFAS 131 sample period ends in fiscal year 2002.

sales in both periods, consistent with foreign markets exhibiting greater average growth opportunities than domestic markets do. The median (mean) number of geographic segments disclosed increases from 2 (2.63) in the pre period to 3 (3.44) in the post period. Both the increase in median and mean are significant at the 1% level (untabulated), suggesting that SFAS 131 brought about significant increases in geographic segment disclosure.

Panel B of Table 2 presents Pearson correlations among the dependent variable, test variables, and selected control variables. Pre- (post-) SFAS 131 correlations are presented above (below) the diagonal. Domestic and foreign earnings changes are significantly correlated with abnormal returns in both the pre- and post-SFAS 131 periods. Domestic earnings changes have a higher correlation with abnormal returns before SFAS 131, whereas foreign earnings changes have a higher correlation with abnormal returns after SFAS 131. Domestic and foreign earnings changes are moderately positively correlated.[14]

4. RESEARCH DESIGN AND EMPIRICAL RESULTS

In this section, we first briefly discuss our research design before reporting the results of our hypotheses tests, including a number of sensitivity analyses. These tests center on whether FERC is an increasing function of disclosures related to foreign operations. In addition we conduct Mishkin (1983) tests to examine whether the underpricing of foreign earnings decreases with such disclosure.

An important feature of our research design is that we conduct two different types of tests for H1-H3. First, for H1 we conduct "before versus after" (i.e., times-series) tests to examine whether the pricing of foreign earnings is associated with the introduction of SFAS 131. Second,

[14] We have computed variance inflation factors (VIF) for all regressions presented. The highest VIF is 2, suggesting that multicollinearity is not an issue in our estimation. In addition, untabulated Durbin-Watson (DW) statistics show that there is no significant autocorrelation in our regression tests (i.e., all DW statistics are around 1.86).

for H2 and H3 we perform cross-sectional tests of whether the pricing of foreign earnings varies with geographic segment disclosure practices *post* SFAS 131.

According to Healy and Palepu (2001), potential endogeneity is the main limitation of disclosure studies. The primary advantage of the before versus after test (H1) is that it does not suffer from this potential endogeneity, as the reporting change we study is mandatory (Piotroski 2003b). However, the challenge in time-series tests is to control for potential confounding events. For this reason, we include controls for a number of potentially important variables that might differ in the pre versus post periods (described in detail below). We also report results using three different samples to minimize the possibility that results are caused by unknown omitted factors.

In our second set of tests (H2 and H3), we conduct cross-sectional tests of variations in disclosure practices in the *post* SFAS 131 period. Thus, there are no time-period effects and consequently less of a concern with confounding events. Given that firms likely do not choose their disclosure strategies randomly, we control for self-selection effects for the cross-sectional tests.

As our research design relates to that of Bodnar and Weintrop (1997), we first estimate a regression of unexpected returns on the change in domestic (ΔDomEarn) and foreign (ΔForEarn) earnings to compare our results to theirs:[15]

$$UR_{i,t} = \beta_{11} + \beta_{12}\ \Delta DomEarn_{i,t} + \beta_{13}\ \Delta ForEarn_{i,t} + \varepsilon_{i,t} \qquad (1)$$

Table 3 reports the results of this test as well as regressions of abnormal returns on either the change in domestic earnings or the change in foreign earnings. Consistent with Bodnar and Weintrop (1997), both the domestic and foreign ERCs are positive and significant at less than the

[15] As a sensitivity test we have re-run our tests using total and foreign earnings changes instead of domestic and foreign earnings changes and find similar results (compare the discussion in Bodnar and Weintrop 1997, 81-83).

1% level, suggesting that investors view both earnings streams as value relevant. In addition, an untabulated F-test shows that, consistent with Bodnar and Weintrop (1997), the estimated coefficient on ΔForEarn is significantly larger than the coefficient on ΔDomEarn, suggesting that the value of the firm is more sensitive to changes in foreign income than it is to changes in domestic income.

4.1 Tests of H1

To test whether FERC is higher after SFAS 131 (H1) we use the following model:

$$UR_{i,t} = \beta_{21} + \beta_{22}SFAS131 + \beta_{23}\Delta DomEarn_{i,t} + \beta_{24}\Delta ForEarn_{i,t} + \beta_{25}SFAS131^{*}\Delta ForEarn_{i,t} + \varepsilon_{i,t} \quad (2)$$

where SFAS131 is an indicator variable that takes the value of one for periods after SFAS 131 is effective and the value of zero otherwise.[16] Considering that SFAS 131 covers a variety of disclosures and is not exclusively related to foreign operations, it is possible that the value relevance of domestic earnings also increases with SFAS 131. In particular, many firms increased the number of industrial segments reported upon adopting SFAS 131 (Berger and Hann 2003a). Although we control for domestic earnings in our empirical tests, as sensitivity analyses we further report results of tests where we interact the SFAS 131 dummy with domestic earnings. We report similar specifications for all subsequent main tests.

We present results using three different samples. First, we estimate the regressions using the full sample pre and post SFAS 131 ("Full Sample"). Using this full sample increases the power of our tests and minimizes the effect that any one year's (possibly unrepresentative) data might have on our results (Ettredge et al. 2005). Second, to address the concern that the first sample has an unequal representation in the two time periods and to increase the internal validity

[16] Regressions are estimated using firm fixed effects.

of our tests (as other things may change as well over our sample period), we restrict the test to an equal number of years (i.e., four years) before and after the new standard ("Balanced Sample"). Finally, we use a fixed sample of firms four years pre and four years post SFAS 131 ("Fixed Sample"). By using a constant sample, concerns over correlated omitted variables are partially alleviated.[17]

The results are reported in Table 4. Both ΔDomEarn and ΔForEarn are positive and significant. The focus, however, is on the interaction term between ΔForEarn and the indicator variable for SFAS 131. For all three samples, the estimated coefficient on this interaction is positive and significant at the 2% level or better (two-sided tests), supporting the notion that foreign earnings are valued more following the new standard. This finding suggests that the disclosure required by SFAS 131 improves the overall disclosure related to foreign operations, consistent with a reduction in the valuation discount. The results of the regression specification which includes an interaction between ΔDomEarn and SFAS131 are similar. The interaction with foreign earnings remains positive and significant. The interaction with domestic earnings is, however, small in magnitude and statistically insignificant for the first two samples, and marginally significant for the fixed sample.[18]

SFAS 131 is unique in that it is the first standard to specifically address financial analysts' complaints (Botosan and Stanford 2005). Street et al. (2000) emphasize the importance of improved consistency in segment reporting following SFAS 131. They state that with the "management approach" required by SFAS 131, external parties can now "see through the eyes

[17] The disadvantages of using a constant sample are that we impose survivorship bias and that we potentially lower the power of our tests due to the smaller sample size.

[18] We do not have any predictions regarding the interaction between SFAS 131 and domestic earnings. On one hand, SFAS 131 clearly includes several disclosure improvements that could affect the pricing of domestic earnings. On the other hand, Thomas (1999) did not find any mispricing related to domestic earnings, suggesting that the uncertainty faced by investors was considerably less than that for foreign earnings.

of management." As a result, investors face less uncertainty and consequently apply a lower "uncertainty discount" to foreign earnings post SFAS 131. Our findings are consistent with Street et al.'s (2000) conclusion that under SFAS 131 foreign business reporting has improved.

4.2. Sensitivity analyses for H1

We conduct several robustness tests. In particular, we consider the effects that firm performance, the percentage of foreign revenues, growth, firm size, structural changes, changes in investor composition, and non-linearities may have on our conclusion that FERC varies with geographic disclosures. The results of these tests are reported in Table 5. Additional sensitivity analyses are described below.

4.2.1. Controlling for foreign profit margin, percentage of foreign revenues, growth, firm size, and firm performance

In our first robustness test, we include controls for four factors potentially affecting our regression results: foreign profit margin, percentage of foreign revenues, firm size, and differential growth rates. First, earnings coefficients may differ over time because of differences in profitability (e.g., Hayn 1995; Burgstahler and Dichev 1997). If foreign operations are more profitable for firms after adoption of SFAS 131, then higher earnings coefficients are expected and previously reported conclusions are confounded. Second, it is possible that investors pay more attention to foreign earnings when these operations are more important for a given firm (as measured by percent foreign revenues), which in turn could affect the pricing of foreign earnings. In Panel A of Table 2, we show that foreign revenues comprise a larger percentage of total revenues in the post-SFAS 131 period compared with the pre-SFAS 131 period, suggesting

that it is potentially important to control for the relative magnitude of foreign operations in our tests. Third, earnings response coefficients may vary with firm size, as firm size relates to overall disclosure level (e.g., Lang and Lundholm 1996) and the extent of sophisticated investor following (Thomas 2004; Callen et al. 2005). Finally, differential revenue growth between domestic and foreign operations may also explain differences in earnings response coefficients (Bodnar and Weintrop 1997).[19] After controlling for the foreign profit margin, percentage of foreign revenues, firm size, and differential growth rates, we find that none of the reported results is materially affected (see Panel A of Table 5).[20] That is, the control variables have either weak or no association with FERC and the interaction between SFAS131 and FERC remains positive and significant at the 1% level for the full sample and for the fixed sample, and is positive and significant at the 5% level for the balanced sample. These findings suggest that our results are not due to lack of control for profitability, the relative magnitude of foreign operations, firm size, and growth.

4.2.2. Controlling for structural changes

Our next robustness check considers whether changes in reported segment disclosures resulting from activities including mergers, acquisitions, internal growth, and divestitures affect reported results. To ensure that our results are not driven by such corporate structural changes, we eliminate firms with a greater than 35% increase or decrease in total assets, as these firms are more likely to undergo major structural changes. Panel B of Table 5 reports that excluding these observations does not materially affect the reported results for any of the three samples (i.e.,

[19] Untabulated tests show that differential growth is significantly positively correlated with future changes in foreign earnings (p-value < 0.01). As an alternative proxy for growth, we have used the foreign revenue growth and obtain consistent results.

[20] For brevity we report these and subsequent sensitivity analyses (for H1, H2, and H3) excluding interactions with domestic earnings. All reported results are robust to including interactions with domestic earnings.

results with the smaller sample sizes are very similar to (and in fact somewhat stronger than) the results reported above).[21]

4.2.3. Changes in institutional ownership over time

The observed increase in FERC following the introduction of SFAS 131 could potentially be explained by changes in investor composition over time. In particular, if our sample firms have more "sophisticated investors" in the post-SFAS 131 period compared with the pre-SFAS 131 period, the observed result could be due to these investors' ability to better interpret existing disclosures or their improved access to alternative information (see, e.g., Bradshaw et al. 2004; Callen et al. 2005). Panel A of Table 2 shows that there is a significantly higher amount of institutional ownership in our sample firms post SFAS 131 compared with the pre period.[22] Thus, we control for institutional ownership in regression tests. We measure institutional ownership as the percent of shares outstanding held by institutions from the CDA/Spectrum Institutional Holdings Database. Panel C of Table 5 shows that institutional ownership is insignificantly related to FERC and that our main result is unaffected for all three samples.[23] This finding suggests that our results are not caused by lack of control for changes in investor composition over time.

4.2.4. Non-linear returns-earnings specification

It is also possible that the increase in FERC could relate to an increase in the incidence of positive changes in foreign earnings in the post-SFAS 131 period. Payne and Thomas (2005)

[21] We have repeated this test using alternative cut-offs (20% and 50%) and find similar results. As an alternative procedure, we follow Ettredge et al. (2005) and delete firms that report a merger, acquisition, or divestiture (Compustat items 129 and 66). Similar results are obtained.
[22] The difference is significant at the 1% level assuming either equal or unequal variances for the two populations.
[23] Results are consistent when we instead use the number of institutional investors.

show that the total earnings response coefficient is higher when changes in earnings are positive. This result could apply to the foreign component of earnings as well. To explore the potential effect of non-linearity in the returns-earnings specification on the effect of SFAS 131 disclosures, we first compute descriptive statistics for domestic and foreign earnings changes in both the pre and post periods. These (untabulated) statistics show that there is no significant difference in the number of negative versus positive earnings innovations for foreign as compared with domestic earnings in the pre and post SFAS 131 periods. Nevertheless, we expand our regression specification by adding both a main effect and an interaction term for positive earnings innovations (as in Hope and Kang 2005). Results reported in Panel D of Table 5 show that positive changes in foreign earnings are priced higher following the new standard. There is no significant change in FERC when changes in foreign earnings are negative. Finding significant results for positive earnings changes alone seems intuitive, as positive earnings changes are more persistent and therefore are more representative of future firm performance (Basu 1997). Similar results have been found for positive versus negative earnings levels (Hayn 1995).[24] As such, positive changes in earnings better reflect concurrent changes in firm value. When accounting earnings are less likely to represent investors' valuation model (i.e., in the case of negative changes in earnings), then earnings coefficients have less ability to reflect improvements in the usefulness of accounting earnings brought about by improved disclosures.

4.2.5. Additional robustness tests for H1

Given the potential for confounding effects in time-series tests, in this section we report on a number of additional sensitivity tests. In particular, we consider effects of early adoption of

[24] We have used two different specifications for the positive earnings indicator: earnings levels and earnings changes. Inferences remain unaltered with both specifications.

SFAS 131, foreign firms listed in the U.S. and U.S. firms listed on foreign exchanges, foreign currency adjustments, taxes, and inter-temporal variations in foreign earnings persistence. The results of these tests are not tabulated for reasons of brevity but are available from the authors.

Early adoption of SFAS 131

Herrmann and Thomas (2000) report that 12% of their sample firms choose to adopt SFAS 131 in the year before the standard became mandatory. For this reason, we re-run our tests excluding all observations for the transition year of December 1997 through November 1998. Results are similar to those reported.

Effects of changes in international cross-listings

It is conceivable that our positive and significant coefficient for SFAS 131 is related to the increase in the number of foreign companies listed on U.S. exchanges during our sample period. Such an increase could imply that investors in general become more familiar with foreign operations and thus apply a lower valuation discount to foreign earnings of U.S. multinationals independent of segment disclosure levels.[25] To control for this possibility, we add the number of foreign companies on U.S. exchanges for each year to our regression.[26] No inferences are affected when we control for variations in foreign listings on U.S. exchanges over time.

Another possibility is that more U.S. firms are listed on foreign stock exchanges after the implementation of SFAS 131 than before. Such overseas listings could attract more foreign investors with greater knowledge about these companies' foreign operations. However, there are strong reasons to believe that this is not the case. First, few U.S. firms are listed outside the U.S

[25] Recall that we already control for the percent of foreign revenues in our tests.
[26] These numbers represent the sum of direct listings and ADRs on the Amex, Nasdaq, and NYSE exchanges. We obtain the data from the World Federation of Exchanges (www.world-exchanges.org).

(e.g., Karolyi 2004; Sarkissian and Schill 2004).[27] Second and more importantly, Frost and Gu (2004) show that there has been a marked *decrease* in the number of U.S. firms listed on foreign exchanges over our sample period.[28] Thus, there is little reason to suspect that foreign listings by U.S. firms can explain our result.

Variations in foreign exchange rates

Foreign income changes incorporate an exchange rate effect. However, Bodnar and Weintrop (1997) demonstrate that their results are not affected by changes in exchange rates. Similarly, Denis et al. (2002, footnote 16) state that their results and the results in prior literature suggest that "exchange rate volatility has little impact on the valuation effect of global diversification." Nevertheless, we examine this issue two ways. First, we incorporate the unrecognized foreign exchange gains or losses (Compustat item 230), recorded in other comprehensive income, into the change in foreign earnings variable. Second, we exclude the foreign currency adjustment in income (Compustat item 150) from the change in foreign earnings. No inferences are changed when using these alternative foreign income numbers.

Income taxes

Income taxes could potentially affect the valuation of foreign earnings (e.g., Collins, Kemsley, and Lang 1998). Prior studies acknowledge that it is difficult to estimate tax effects

[27] In addition, even among those U.S. firms that are listed abroad, few actually raise capital in foreign markets. There is also very limited trading of these shares on the foreign exchanges (e.g., Frost and Gu 2004). Frost and Gu (2004) find that the advertised benefits of listing overseas, such as increased visibility through greater media coverage and a broader investor base, do not appear to be significant for U.S. companies. They suggest that this evidence might explain the steadily diminishing numbers of U.S. firms listed on foreign exchanges.

[28] Specifically, from Table 1 in Frost and Gu (2004) that compares the years 1992 and 2000, we see that (1) the number of U.S. firms listed abroad decreased from 596 to 367; (2) as a percentage of firms listed on international exchanges, U.S. firms decreased from 5.9% to 3.0%; (3) the percentage of U.S. firms cross-listing decreases from 9.1% to 5.3%; and (4) the percentage of U.S. firms to total foreign firms listed on international exchanges decreases from 22.2% to 17.1%.

since researchers have access to external financial statements only and not to income tax records. We repeat the analysis using domestic and foreign earnings before taxes and find similar results as those reported. Although this sensitivity analysis does not exclude the possibility that firms manage their pretax earnings to minimize taxes or that tax rates have changed over time, our robustness test alleviates the concern that our results are driven by the differential tax expense for domestic and foreign operations.

Changes in earnings persistence

Ceteris paribus, if the persistence of foreign earnings increases over time, one would expect a higher valuation multiple applied to this earnings stream. However, we document in Table 8 (discussed in detail later in the paper) that the persistence of foreign earnings has *declined* in the post-SFAS 131 period, whereas the persistence of domestic earnings is almost identical in the pre- and post-SFAS 131 periods. A decline in foreign earnings persistence works against our hypothesis that FERC will increase following adoption of SFAS 131. To empirically test the effects of persistence on the results, we estimate domestic and foreign earnings persistence using annual cross-sectional regressions and then add these estimates as control variables to our main tests. We do not employ firm-specific estimates of persistence as there are a limited number of time-series observations (foreign earnings are not provided on a quarterly basis). We find that results are nearly identical to those reported in Table 4.

Collectively, the evidence presented in tables 4 and 5 and the additional sensitivity analyses described above suggest that SFAS 131 had a significantly positive effect on the pricing of foreign earnings. Although we control for a number of factors that may differ in the post period compared with the pre period (as well as factors that vary across companies), we

acknowledge, however, the possibility that our result could be related to some unknown macro effect. For this reason we now turn to cross-sectional tests of variations in geographic segment disclosure *post* SFAS 131. These cross-sectional tests are not subject to this limitation.

4.3. Tests of H2 and H3

For the cross-sectional tests of H2 and H3, we use only observations in the *post* SFAS 131 period (except in sensitivity analyses as explained below). We first test whether FERC is positively associated with the *change* in the number of geographic segments disclosed after SFAS 131 (H2):

$$UR_{i,t} = \beta_{31} + \beta_{32}\Delta GSEG + \beta_{33}\Delta DomEarn_{i,t} + \beta_{34}\Delta ForEarn_{i,t} + \beta_{35}\Delta GSEG^{*}\Delta ForEarn_{i,t} + \varepsilon_{i,t} \quad (3)$$

where ΔGSEG is an indicator variable that takes the value of one if there is an increase in the number of geographic segments in the fiscal year in which the firm adopts SFAS 131 (zero otherwise).[29] Panel A of Table 6 illustrates that the coefficients on domestic and foreign earnings changes are positive and statistically significant. As predicted, the estimated coefficient on the interaction term of ΔGSEG and ΔForEarn is positive and significant at less than the 1% level. Firms that increase their reported number geographic segments following adoption of SFAS 131 have a higher valuation of foreign earnings compared to those firms that report no increase.[30] The results hold when including an interaction between ΔDomEarn and ΔGSEG.[31]

[29] We also consider alternative specifications where ΔGSEG is either a continuous measure or a percentage measure of the change in segments disclosed. No inferences are changed with these alternative specifications.

[30] Untabulated results show that the effect on FERC is even greater for firms that increase by two or more their reported geographic segments. This result provides further support for the contention that increased disaggregation is valued by investors.

[31] The coefficient on the interaction with foreign earnings is significantly greater than the coefficient on the interaction with domestic earnings.

We next turn to cross-sectional tests of performance measures. To determine whether FERC is greater for firms that include earnings in their geographic segment disclosures in the post-SFAS 131 period (H3), we estimate the following model:

$$UR_{i,t} = \beta_{41} + \beta_{42}\ PMEAS + \beta_{43}\Delta DomEarn_{i,t} + \beta_{44}\Delta ForEarn_{i,t} + \beta_{45}PMEAS^{*}\ \Delta ForEarn_{i,t} + \varepsilon_{i,t} \quad (4)$$

where PMEAS is an indicator variable that takes the value of one if the firm discloses at least one performance measure in its geographic segment disclosures post SFAS 131 (zero otherwise).[32] Results are reported in Panel A of Table 6. The coefficient on the interaction between ΔForEarn and PMEAS is positive and statistically significant (p-value < 0.01), which supports H3.[33] When we add the interaction between ΔDomEarn and PMEAS, the estimated coefficient is small and statistically insignificant, and other results are consistent with those described above.

To investigate whether the inclusion of geographic earnings has incremental value relevance to investors over and above the change in the number of geographic segments disclosed, we estimate the following model:

$$\begin{aligned} UR_{i,t} = {} & \beta_{51} + \beta_{52}\Delta GSEG + \beta_{53}PMEAS + \beta_{54}\Delta DomEarn_{i,t} + \beta_{55}\Delta ForEarn_{i,t} \\ & + \beta_{56}\Delta GSEG^{*}\Delta ForEarn_{i,t} + \beta_{57}PMEAS^{*}\Delta ForEarn_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (5)$$

The empirical results of this regression are reported in Panel A of Table 6. The interactions of ΔForEarn with both ΔGSEG and PMEAS are positive and significant, suggesting that both disclosure effects are incrementally value relevant.

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[32] Specifically, the Compustat segment database classifies six measures of performance: operating income before depreciation, operating income after depreciation, operating income, income before extraordinary items, pretax income, and net income. Our performance measure takes the value 1 if the firm discloses at least one of these measures for its geographic segments during the year when the firm implements SFAS 131 and the fiscal year is post 131; otherwise it takes the value 0. Note that in our sample, if a firm discloses a particular earnings measure for one geographic segment, it always discloses the same measure for all its geographic segments disclosed that year.

[33] The magnitude of the estimated coefficient (2.005) suggests that investors find disclosure of performance measures to be an economically important means of reducing uncertainty about foreign operations.

4.4. Sensitivity analyses for H2 and H3

We perform four types of sensitivity analyses. We first conduct "difference-in-difference" tests in which we estimate regressions (3) and (4) in the *pre* period and test for differences between the two periods. Second, we check if our findings are robust to the inclusion of a set of control variables. Third, we examine if our results are sensitive to controlling for structural changes. Finally and perhaps most importantly, we perform self-selection tests.

4.4.1. Difference-in-difference tests

Our focus for the cross-sectional tests of H2 and H3 is to examine whether FERC varies systematically with geographic segment disclosures in the post-SFAS 131 period. However, it is possible that differences in FERC between firms existed before implementation of SFAS 131. Differences in FERC could be related to uncontrolled firm characteristics rather than to ΔGSEG or PMEAS. To test for this, we estimate regressions (3) and (4) in the pre-SFAS 131 period. Thus, the pre-SFAS 131 period acts as a control period in our cross-sectional analysis. If differences in FERC existed prior to SFAS 131, then results are confounded.

Panel B of Table 6 shows that there is no significant relation between ΔGSEG (PMEAS) and FERC in the pre-SFAS 131 period. Furthermore, the table shows that the differences between the interaction of ΔGSEG (PMEAS) and FERC in the post versus pre periods are significantly positive (at the 2% level or better). These results lend additional credence that evidence in support of H2 and H3 reported previously is not driven by correlated omitted variables.

4.4.2. Control variables

We use the same set of control variables as for H1: foreign profit margin, percent foreign revenues, firm size, and differential growth between domestic and foreign revenues. Panel A of Table 7 shows that no inferences are affected after controlling for these factors. Specifically, whereas the interactions between the control variables and FERC are insignificant (except for the marginal significance of the interaction between FERC and firm size in the ΔGSEG test), the interactions between ΔGSEG and FERC (and PMEAS and FERC) remain positive and significant.[34]

4.4.3. Structural changes

If a firm doubles in size through a merger, its number of geographic segments may very well increase. In such a situation it is not clear that an increase in the number of geographic segments implies an enhanced information environment. Regarding the decision to report geographic performance (PMEAS), it is less clear what effect corporate structural changes would have. Nevertheless, similar to our H1 test, to ensure that our results are not driven by corporate structural changes, we eliminate firms with a greater than 35% increase or decrease in total assets.[35] Panel B of Table 7 shows that results for H2 and H3 are similar after eliminating firms that undergo major structural changes.

[34] As an additional sensitivity analysis, we have included the number of line-of-business segments both as an additional control variable and interacted with domestic and foreign earnings. Results (untabulated) are similar to those reported and all inferences remain the same.

[35] Similar to the H1 test, we have re-run this test using alternative cut-offs and also employed the Ettredge et al. (2005) technique of using Compustat data items to identify mergers, acquisitions, or divestitures.

4.4.4. Selection tests

Results to this point are consistent with increased geographic segment disclosures leading to higher valuations for foreign earnings. However, one possible concern is that disclosure choices under SFAS 131 are potentially endogenous to the model. Firms' decisions on whether to increase the number of geographic segments and/or to disclose performance measures for each geographic segment are affected not only by the mandated requirements of SFAS 131, but also by voluntary decisions related to the tradeoff between the proprietary costs of these additional disclosures and the potential valuation benefits resulting from mitigating the information asymmetry between managers and investors and/or between different investors.[36,37] Hence, our conclusions may suffer from self-selection biases. That is, firms' decisions to increase the number of geographic segments and/or include performance measures may be caused by a host of other factors. And it could be these other factors, rather than an improved geographic segment disclosure, that lead to differences in earnings response coefficients.

To address endogeneity issues due to self-selection, we follow a similar research design as Leuz and Verrecchia (2000) and use a two-stage Heckman (1979) estimation approach. In the first stage, we use Probit estimation to model the decision to increase the number of geographic segments disclosed or to disclose geographic earnings after adoption of SFAS 131. In the second

[36] To ensure that the inclusion of performance measures is voluntary and not mandated by SFAS 131 (i.e., that the geographic segments are not operating segments), we have re-run tests after excluding (the small number of) firms that disclose capital expenditures and depreciation (both required for operating segments). No inferences are affected by eliminating these observations.

[37] The choice of the number of geographic segments to disclose is affected by the mandates of SFAS 131 as well as management's strategic considerations. Our view is that the number of geographic segments disclosed is largely a voluntary decision.

stage, we estimate equations (3) to (6) after controlling for the inverse Mills ratios computed using the first stage results.[38]

In the Probit models, we introduce variables that proxy for external demands to reduce information asymmetries between managers and users of financial statements and among investors.[39] Following Cohen (2004), we compute a variable OWNER defined as the (industry-adjusted) natural logarithm of the number of common shareholders. We also include a variable, ASYMMETRY, which measures the asymmetry of information between managers and analysts (Botosan and Harris 2000). This variable is computed as the coefficient of variation of analysts' earnings forecasts from three months before the announcement of annual earnings as reported by I/B/E/S. As a proxy for the information asymmetry among investors, we use the probability of informed trade (PIN). The PIN, which was developed by Easley, Kiefer, and O'Hara (1997) and which has been widely used in recent research (e.g., Brown, Hillegeist, and Lo 2004; Botosan, Plumlee, and Xie 2004; Easley, Hvidkjaer, and O'Hara 2002), is a firm-specific estimate of the probability that a specific trade originates from a privately-informed investor, and hence, directly captures the extent of information asymmetry among investors in the secondary market (Brown et al. 2004).[40]

Highly indebted firms may be under greater pressure to disclose more since debtholders need more information for monitoring. We compute LEVERAGE as total liabilities (#181) divided by total assets (#6). In addition, we include the current ratio (current assets #4 divided by

[38] We estimate the Probit models cross-sectionally every year post SFAS 131 adoption to compute annual inverse Mills ratios. A complete description of this research methodology, including the computation of the inverse Mills ratio, can be found in Maddala (1983).

[39] We do not include variables that are derived from market returns since returns are the dependent variable in the second stage.

[40] We obtain the PIN data from http://www.smith.umd.edu/faculty/hvidkjaer/.

current liabilities #5) as a proxy for LIQUIDITY.[41] Low liquidity firms may be under different pressures to disclose than are other firms.

As proxies for proprietary costs of disclosure, we include a measure of capital intensity (CAPIT), computed as (industry-adjusted) capital expenditures (#128) divided by net sales (#12), and the Herfindahl Index (HERF). Following the extant literature, we include the industry concentration ratio (HERF) to control for the effects of industry-specific competition on disclosure (Berger and Hann 2003b; Verrecchia 1983). HERF equals $\sum_{i=1}^{n}(s_i / S)^2$ where: s_i is the segment's sales and S is the sum of sales for all segments in an industry (defined by 2-digit SIC code) and n is the number of firms (segments) in the industry. To obtain a firm-specific measure of this index, we compute the weighted average across firms' segments using the segments' sales as weights.

We control for future growth opportunities with the market-to-book ratio (MB) and for firm performance with return on equity (ROE) as well as domestic and foreign profit margins (PM_DOM, PM_FOR) since previous research associates firm performance with disclosure strategies (e.g., Lang and Lundholm 1996). Finally, we control for SIZE using the natural logarithm of total assets (#6).

We thus estimate separately in the first stage the following two Probit models for our two disclosure choices:

$$\begin{aligned}\Delta GSEG_{i,t}\,(PMEAS_{i,t}) = {} & \alpha_{11} + \alpha_{12}\,OWNER_{i,t} + \alpha_{13}\,ASYMMETRY_{i,t} + \alpha_{14}\,PIN_{i,t} + \\ & \alpha_{15}\,LEVERAGE_{i,t} + \alpha_{16}\,LIQUID_{i,t} + \alpha_{17}\,CAPIT_{i,t} + \alpha_{18}\,HERF_{i,t} + \alpha_{19}\,MB_{i,t} + \\ & \alpha_{1\,10}\,ROE_{i,t} + \alpha_{1\,11}\,PM\_DOM_{i,t} + \alpha_{1\,12}\,PM\_FOR_{i,t} + \alpha_{1\,13}\,SIZE_{i,t} + \varepsilon_{i,t}\end{aligned} \quad (6)$$

[41] As alternative measures of liquidity, we use (1) working capital divided by total assets and (2) cash flow from operating activities divided by net sales and obtain similar results.

In the second stage, we estimate regressions (3) and (4) and control for the inverse Mills ratios computed from the first stage.

Table 8 presents the empirical results of estimating these self-selection models.[42] Both first-stage models are significant, with Likelihood Ratio p-values of <0.001 and 0.013, respectively. For the ΔGSEG model, ASYMMETRY, CAPIT, MB, and SIZE are significant explanatory variables. For the PMEAS model, MB and PM_FOR are significant. More importantly, the second-stage results are consistent with our main test results. That is, both ΔGSEG and PMEAS are positively associated with FERC after controlling for self-selection bias.

Our results for SFAS 131 *per se* (H1), change in the number of geographic segments (H2), and inclusion of performance measures in geographic segment disclosures (H3) are consistent with prior research showing that segment disclosures may enhance security valuation (e.g., Kinney 1971; Tse 1989).[43] Our results may also be consistent with reduced mispricing from SFAS 131 disclosures (Aboody et al. 2002), which we examine formally in our mispricing tests next.

[42] The reported first-stage results are for Probit models corresponding to the year of SFAS 131 adoption. Results for the other post SFAS 131 years are similar and are available upon request. The second-stage results are robust to also including interactions with domestic earnings.

[43] In a previous version of this paper, we combined the tests for H1 and H2-H3 into the same regressions. The results of these alternative specifications are as follows. First, all results are consistent with those reported here. Second, we find that both ΔGSEG and PMEAS have incremental value relevance over and beyond the general benefits provided by SFAS 131. Specifically, when either ΔGSEG or PMEAS is included in the regression along with the SFAS131 dummy, both ΔGSEG (or PMEAS) and SFAS131 are positive and significant. Furthermore, when all three variables are included in the same regression, both ΔGSEG and PMEAS are positive and significant whereas SFAS131 is positive but not significant at conventional levels. The latter result could be interpreted as follows. Geographic segment disclosures, including the reporting of performance measures, dominate the overall effect of the introduction of SFAS 131. Alternatively, the lack of significance could reflect the low power of the test stemming from partitioning the sample into small sub-groups. Finally, Ettredge et al. (2005), who report similar regressions that combine time-series and cross-sectional tests, interpret the insignificant coefficient on their SFAS131 variable to mean that there were no macro changes contemporaneous to SFAS 131 that caused earnings response coefficients to increase.

4.5. Mispricing tests

To test directly whether investors' mispricing of foreign earnings as documented by Thomas (1999) is mitigated with SFAS 131 geographic segment disclosures (H4), we employ the Mishkin (1983) framework.

The Mishkin test determines whether the market rationally prices the foreign and domestic earnings components.[44] As in Thomas (1999), we estimate simultaneously (1) the forecasting equation for total earnings changes and (2) the rational pricing equation for abnormal earnings changes, using nonlinear least squares for the pooled sample:

$$\begin{aligned} \Delta Earn_{i,t+1} &= \alpha_0 + \alpha_D \Delta DomEarn_{i,t} + \alpha_F \Delta ForEarn_{i,t} + \varepsilon_{i,t+1} \\ AR_{i,t+1} &= \beta_{71} + \beta_{72}(\Delta Earn_{i,t+1} - \alpha_0 - \alpha_D^* \Delta DomEarn_{i,t} - \alpha_F^* \Delta ForEarn_{i,t}) + \xi_{i,t+1} \end{aligned} \quad (7)$$

In the above equations, $\Delta Earn_{i,t+1}$ is total earnings change next year, $\Delta DomEarn_{i,t}$ and $\Delta ForEarn_{i,t}$ are the domestic and foreign earnings changes in the current year, and $AR_{i,t+1}$ is the abnormal return one year ahead. Market efficiency imposes the constraints that $\alpha_D = \alpha_D^*$ and $\alpha_F = \alpha_F^*$. These nonlinear restrictions imply that stock prices impound correctly the persistence of total earnings changes that is attributable to both domestic and foreign earnings changes.[45]

To ensure comparability with the extant literature, we modify the computation of returns from the previous section. Adjusting the raw returns with expected returns from the market model can generate unwanted correlations with the earnings numbers from previous periods over which the parameters of the model are estimated. Following Sloan (1996), we use size-adjusted

[44] More comprehensive discussions can be found in Sloan (1996), Dechow and Sloan (1997), and Thomas (1999). The Mishkin test has certain limitations (see, e.g., Kraft et al. 2005). We view the Mishkin test as a *complement* to our ERC tests. In other words, we do not rely on the results of Mishkin tests alone. In addition, we follow Thomas (1999) who uses a changes specification. Such a specification is likely a stronger test of mispricing than is a levels test.

[45] Market efficiency is tested using a likelihood ratio statistic that is distributed $\chi^2(q)$ and is equal to *2n Log* (SSR^c/SSR^u) where q is the number of constraints, n is the number of observations, SSR^c is the sum of squared residuals for the constrained system, and SSR^u is the sum of squared residuals from the unconstrained system.

stock returns.[46] We scale earnings changes by average total assets and control for influential observations that may drive the results by eliminating all observations that have scaled earnings changes greater than 0.25, as in Thomas (1999).[47] These requirements result in a sample of 10,528 observations for the Mishkin test.

We estimate the system of equations separately for both the pre- and post-SFAS 131 periods. The results of these tests are reported in Table 9. The results for the pre-SFAS 131 period are comparable to those reported in Thomas (1999, Table 2, Panel B). The difference in the domestic earnings coefficients ($\alpha_D - \alpha_D^* = -0.051$) is not significant (with a p-value of 0.342), while the difference in the foreign earnings coefficients ($\alpha_F - \alpha_F^* = 0.451$) is significant (p-value 0.004). These results suggest that investors rationally price domestic earnings changes, whereas investors discount foreign earnings changes even though they exhibit a lower mean reversal than domestic earnings. Specifically, stock prices underestimate the extent to which changes in foreign earnings persist (see Thomas 1999, 253) in the pre-SFAS 131 period. In the post-SFAS 131 period (1999 to 2002), however, the differences in domestic coefficients or foreign earnings coefficients are economically small and insignificant (with p-values of 0.889 and 0.921, respectively). These results are consistent with the notion that improved disclosure related to foreign operations can mitigate the mispricing of foreign earnings.

We do not report results of similar tests for comparing firms that increase geographic segments versus those that do not and for firms that include performance measures in geographic segments versus those that do not because the small sample sizes post SFAS 131 do not allow for a reliable estimation when slicing the sample.

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[46] Specifically, we compute abnormal returns by subtracting from the raw returns the value-weighted returns of the size decile portfolios provided by CRSP, where the size decile membership is determined at the time when returns start cumulating (i.e., three months after the fiscal year end).

[47] This outlier screening reduces the sample by 2.9%. Inferences are not affected if we do not delete extreme observations.

Overall, we find clear evidence that the mispricing of foreign earnings is decreasing in the level of foreign operations disclosures. It is somewhat reassuring that standard setters mandate, and firms provide, information to investors that is useful in correcting the mispricing of foreign earnings.

5. CONCLUDING REMARKS

Prior research conjectures that poor disclosure of foreign operations may cause investors to discount foreign earnings. The recent mandate of SFAS 131 brought about significant changes in the disclosure of information related to geographic segments and therefore foreign earnings. Not all of these changes are mandatory. In fact, some of them are simply suggested disclosures. Our study investigates whether the additional disclosures mandated or suggested under SFAS 131 have led to incremental pricing of foreign earnings components and thereby to some extent corrected the underpricing documented in prior research. Specifically, we document that the foreign earnings response coefficient is increasing in (1) the introduction of SFAS 131, (2) an increase in the number of geographic segments disclosed, and (3) the inclusion of performance measures in geographic segments. These results are robust to a number of sensitivity analyses and provide standard setters with evidence supporting the benefit of such disclosures.

In addition to our tests of the effect of enhanced disclosure on the foreign earnings response coefficient, we present results of mispricing based on the Mishkin (1983) test. The results indicate that the mispricing disappears following the introduction of SFAS 131. One caveat is that we have few observations post SFAS 131, which makes the estimation of these tests unreliable for subsamples of firms based on the change in the number of geographic

segments and the inclusion of earnings in geographic segment disclosures. We believe that such retesting of market mispricing based on changes in the information environment of a firm has a wide variety of applications in accounting and finance research.

Our study is the first to establish a link between geographic segment disclosures and the valuation of foreign earnings. Our results are consistent with Lang and Lundholm (1996), Lundholm and Myers (2002), and Gelb and Zarowin (2002) who conclude that disclosure quality is linked to the ability of investors to predict firm performance. More generally, our findings provide support for FASB's view that the adoption of SFAS 131 and its resulting disaggregation of segment data would have capital market benefits (Berger and Hann 2003b). In addition, we provide evidence that reinforces equity investors' contention that such disclosures are value relevant.[48]

Diamond (1985) argues in favor of the welfare role of public disclosure because it obviates the need for each individual investor to expend resources on costly information gathering. In other words, disclosure essentially turns private information into public information.[49] With respect to voluntary disclosure of performance measures in geographic segments, our findings indicate that investors find such disclosures to be value relevant. Critics of SFAS 131 have argued that the lack of mandatory earnings disclosure is one of the shortcomings of SFAS 131.

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[48] According to FASB's Conceptual Framework (FASB 1980), relevance and reliability are the prime characteristics of accounting information. With respect to reliability, enhanced geographic segment disclosures could increase verifiability because they provide additional information related to foreign operations (Ettredge et al. 2005). In addition, the documented improved consistency in reporting following SFAS 131 likely enhances the reliability of segment disclosures. However, given that geographic earnings are not required to be disclosed and that firms that choose to disclose may use either GAAP or non-GAAP performance metrics, we do not draw conclusions regarding reliability.

[49] In the models of Merton (1987) and Fishman and Hagerty (1989), disclosure reduces the cost of becoming informed, thereby increasing the pool of potential investors and lowering the firm's cost of capital. Easley and O'Hara (2004) provide a comprehensive review of this stream of research.

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Table 1: Sample Description

Panel A: Sample Selection

Description of the Data	Sample Size Firms	Obs.
Sample of Compustat firms incorporated in the U.S. with per share foreign and domestic earnings available (computed following Bodnar and Weintrop 1997). We require also that the two measures are available for the previous year.	2,805	17,676
Sample with available return data (twelve-month returns compounded to three months after the fiscal year end)	2,476	14,972
Sample with available earnings and price data as well as return data to compute the parameters of the market model (36 months of data before the current year are required). (We require that current year and previous year earnings and previous year end stock price are available)	1,939	11,503
Final sample for H1 tests after eliminating observations in top and bottom half percentile of the earnings variables (change in domestic and foreign earnings scaled by beginning stock price)	1,925	11,328
Post SFAS 131 final sample for H2 and H3 tests after eliminating observations in top and bottom half percentile of the earnings variables (change in domestic and foreign earnings scaled by beginning stock price).	1,211	3,663

Panel B: Sample Structure

Percentage of firms that increase the number of geographic segments when adopting SFAS 131	23.78%
Percentage of firms that disclose at least one performance (or earnings) measure when adopting SFAS131	35.03%

Table 2: Descriptive Statistics and Correlations

Panel A: Descriptive statistics

Pre SFAS 131	N	Median	Mean	Q1	Q3
Market value (millions)	7,665	338.1	2,510.3	67.1	1,610.9
UR	7,665	-0.076	-0.001	-0.296	0.167
ΔForeign earnings	7,665	0.001	0.003	-0.007	0.008
ΔDomestic earnings	7,665	0.002	0.010	-0.025	0.028
Foreign revenue	7,467	0.233	0.258	0.091	0.395
Foreign revenue growth	6,142	0.102	0.167	-0.017	0.251
Domestic revenue growth	7,474	0.069	0.091	-0.016	0.168
Number of geographic segments	7,665	2.000	2.630	2.000	3.000
Percent of shares owned by institutions	6,325	0.445	0.419	0.251	0.591

Post SFAS 131	N	Median	Mean	Q1	Q3
Market value (millions)	3,663	582.1	3,773.5	122.3	2,519.9
UR	3,663	-0.098	0.127	-0.387	0.366
ΔForeign earnings	3,663	0.001	0.002	-0.007	0.008
ΔDomestic earnings	3,663	-0.002	0.002	-0.031	0.022
Foreign revenue	3,122	0.334	0.349	0.196	0.479
Foreign revenue growth	2,972	0.043	0.169	-0.083	0.231
Domestic revenue growth	3,376	0.025	0.058	-0.094	0.146
Number of geographic segments	3,663	3.000	3.440	2.000	4.000
Percent of shares owned by institutions	3,114	0.532	0.479	0.301	0.673

Table 2: Descriptive Statistics and Correlations (continued)

Panel B: Sample Correlations (pre SFAS 131 above diagonal, post SFAS 131 below diagonal)

	UR	ΔDomestic earnings	ΔForeign earnings	Market value	PM domestic	PM foreign	ΔGSEG
UR	-	0.259***	0.139***	-0.022**	-0.006	0.016	-
ΔDomestic earnings	0.113***	-	0.211***	-0.047***	0.018	0.006	-
ΔForeign earnings	0.151***	0.091***	-	-0.037***	-0.026**	0.004	-
Market value	0.009	-0.018	-0.003	-	0.025**	-0.005	-
PM domestic	0.026	0.036**	0.053***	0.041**	-	0.003	-
PM foreign	0.015	0.019	0.068***	0.106***	-0.012	-	-
ΔGSEG	0.051***	0.003	0.017	0.048***	0.041**	0.019	-
PMEAS	0.003	0.001	0.012	-0.009	0.039**	0.012	0.083***

Panel A: UR is annual abnormal return computed using the market model. The parameters of the market model are estimated over the 36 months preceding the current fiscal year using value-weighted market returns. The monthly returns are cumulated starting the fourth month after the previous fiscal year end month and ending three months after the termination of the current fiscal year. ΔForeign (ΔDomestic) earnings is the change in per share after tax foreign earnings (domestic earnings) scaled by the stock price at the end of the previous year. Foreign revenue is foreign revenues as collected from the Compustat segment data divided by total revenues. Foreign (domestic) revenue growth is year-over-year percentage change in foreign (domestic) revenues.

Panel B: Pearson correlation coefficients are reported. PM is profit margin computed as foreign (domestic) after tax earnings divided by foreign (domestic) revenues. ΔGSEG is an indicator variable that takes the value one if the observation is post SFAS 131 and belongs to a firm that increased the number of geographic segments post SFAS 131 (zero otherwise). PMEAS is an indicator variable that takes the value one if the observation is post SFAS 131 and belongs to a firm that discloses at least one performance (earnings) measure post SFAS 131 (zero otherwise). ***, ** and * denote significance at the 1%, 5% and 10% levels (two-sided tests), respectively.

Table 3: Regressions of Unexpected Stock Returns on Changes in Total, Domestic and Foreign Earnings

	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Intercept	0.040***	6.00	0.040***	5.99	0.040***	5.93	0.040***	6.01
ΔDomEarn			0.827***	18.74			0.754***	16.84
ΔForEarn					1.555***	11.88	1.140***	8.66
N	11,328		11,328		11,328		11,328	
Adj R^2	0.035		0.030		0.012		0.036	

Regressions are run using firm fixed-effects estimation. The dependent variable is UR which is annual abnormal return computed using the market model. The parameters of the market model are estimated over the 36 months preceding the current fiscal year using value-weighted market returns. The monthly returns are cumulated starting the fourth month after the previous fiscal year end month and ending three months after the termination of the current fiscal year. ΔDomEarn (ΔForEarn) is the change in per share after tax domestic (foreign) earnings scaled by the stock price at the end of the previous fiscal year. ***, ** and * denote significance at the 1%, 5% and 10% levels (two-sided tests), respectively.

Table 4: Impact of the adoption of SFAS 131 on the foreign ERC (H1)

	Full Sample				Balanced Sample				Fixed Sample			
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Intercept	0.040***	6.02	0.040***	6.02	0.029***	3.01	0.029***	3.02	0.013	1.05	0.013	1.06
SFAS131	0.133***	7.22	0.132***	7.20	0.155***	6.93	0.154***	6.91	0.151***	6.33	0.150***	6.26
ΔDomEarn	0.764***	17.09	0.716***	13.31	0.834***	12.27	0.778***	7.50	0.845***	6.68	0.551***	2.74
ΔForEarn	0.846***	5.50	0.875***	5.65	1.078***	4.23	1.114***	4.28	1.160***	2.70	1.284***	2.95
ΔDomEarn * SFAS131			0.158	1.62			0.095	0.69			0.488*	1.88
ΔForEarn * SFAS131	1.134***	3.83	1.065***	3.56	0.888**	2.34	0.838**	2.16	2.227***	3.70	1.973***	3.20
N	11,328		11,328		7,098		7,098		2,520		2,520	
Adj R^2	0.042		0.042		0.041		0.041		0.067		0.068	

Regressions are run using firm fixed-effects estimation. The dependent variable is UR which is annual abnormal return computed using the market model. The parameters of the market model are estimated over the 36 months preceding the current fiscal year using value-weighted market returns. The monthly returns are cumulated starting the fourth month after the previous fiscal year end month and ending three months after the termination of the current fiscal year. ΔDomEarn (ΔForEarn) is the change in per share after tax domestic (foreign) earnings scaled by the stock price at the end of the previous fiscal year. SFAS131 is an indicator variable that takes the value one if the observation is post SFAS 131 and zero otherwise. Full Sample refers to the entire sample period, Balanced Sample has only 4 years prior and 4 years after SFAS131 adoption observations, Fixed Sample has only firms that have data 4 years before and 4 years after SFAS 131 adoption. ***, ** and * denote significance at the 1%, 5% and 10% levels (two-sided tests), respectively.

Table 5: **Sensitivity Analyses for H1**

Panel A: Controls for foreign operations profit margin, foreign revenue percentage, firm size, and differential sales growth

	Full Sample		Balanced Sample		Fixed Sample	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Intercept	0.040***	5.55	0.049***	4.51	0.029**	2.08
SFAS131	0.240***	10.69	0.249***	8.84	0.193***	6.56
PM	0.001	0.62	0.001	0.63	-0.002	-0.12
FShare	-0.006	-0.07	-0.064	-0.45	0.253*	1.79
Size	-0.211***	-10.44	-0.259***	-8.17	-0.147***	-4.16
DiffGrowth	-0.001	-0.80	-0.050*	-1.73	0.009	1.50
ΔDomEarn	0.769***	14.95	0.745***	9.25	0.619***	4.43
ΔForEarn	1.297***	2.83	2.261***	2.86	3.576**	2.49
ΔForEarn * SFAS131	0.978***	3.04	0.856**	2.03	1.933***	3.10
ΔForEarn * PM	-0.014	-0.53	-0.009	-0.28	0.051	0.10
ΔForEarn * FShare	-0.955*	-1.66	-1.038	-1.10	-1.264	-0.76
ΔForEarn * Size	-0.039	-0.58	-0.180*	-1.68	-0.288*	-1.80
ΔForEarn * DiffGrowth	-0.004	-0.19	-0.099	-0.18	0.256	1.10
N	8,980		5,491		2,144	
Adj R^2	0.054		0.046		0.062	

Panel B: Control for structural changes (remove firms with more than 35% change in total assets)

	Full Sample		Balanced Sample		Fixed Sample	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Intercept	0.047***	5.89	0.037***	3.28	0.010	0.79
SFAS131	0.153***	7.71	0.174***	7.05	0.157***	6.31
ΔDomEarn	0.811***	13.33	0.860***	10.27	0.659***	4.85
ΔForEarn	0.955***	4.62	1.049***	3.26	1.074**	2.49
ΔForEarn * SFAS 131	1.341***	3.91	1.255***	2.80	3.103***	5.04
N	8,073		5,452		2,187	
Adj R^2	0.042		0.042		0.076	

Table 5: **Sensitivity Analyses for H1**

Panel C: Control for Institutional Shareholders' Percentage Holdings						
	Full Sample		**Balanced Sample**		**Fixed Sample**	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Intercept	0.045***	6.25	0.047***	4.60	0.030*	1.88
SFAS131	0.187***	8.88	0.205***	8.13	0.167***	5.40
Instit	-0.696***	-7.85	-0.915***	-7.36	-0.596***	-3.35
ΔDomEarn	0.807***	16.27	0.822***	11.24	0.905***	5.79
ΔForEarn	0.693***	2.88	1.068***	2.80	1.828**	2.26
ΔForEarn * SFAS131	1.101***	3.45	1.137***	2.81	3.378***	4.83
ΔForEarn * Instit	0.525	0.79	-0.688	-0.77	-2.113	-1.14
N	9,439		5,983		1,692	
Adj R^2	0.051		0.048		0.088	
Panel D: Controls for positive and negative foreign earnings innovations						
	Full Sample		**Balanced Sample**		**Fixed Sample**	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Intercept	0.041***	6.10	0.030***	3.12	0.014	1.14
POS	0.069***	4.02	0.063***	2.71	0.028	0.99
SFAS131	0.109***	5.35	0.129***	5.31	0.105***	3.92
ΔDomEarn	0.738***	16.25	0.804***	11.84	0.821***	6.53
ΔForEarn	-1.779***	-4.06	-0.901	-1.45	-0.490	-0.53
ΔForEarn * POS	3.768***	7.03	2.480***	3.28	2.218**	1.97
ΔForEarn * SFAS131	0.056	0.08	0.058	0.08	0.062	0.06
ΔForEarn * SFAS131* POS	1.980**	2.23	1.891**	1.96	4.392***	2.99
N	11,328		7,098		2,520	
Adj R^2	0.052		0.046		0.079	

Regressions are run using firm fixed-effects estimation. The dependent variable is UR which is annual abnormal return computed using the market model. The parameters of the market model are estimated over the 36 months preceding the current fiscal year using value-weighted market returns. The monthly returns are cumulated starting the fourth month after the previous fiscal year end month and ending three months after the termination of the current fiscal year. ΔDomEarn (ΔForEarn) is the change in per share after tax domestic (foreign) earnings scaled by the stock price at the end of the previous fiscal year. PM is the profit margin of foreign operations. FShare is foreign revenues as percent of total revenues. Size is the logarithm of total assets. No inferences are changed if we instead use the first difference in size. DiffGrowth is the difference between year-to-year foreign sales growth and domestic sales growth (consistent with Bodnar and Weintrop 1997). The sample size for the Panel A sensitivity analysis is reduced given the need to have non-zero values for domestic and foreign sales in the previous year. SFAS131 is an indicator variable that takes the value one if the observation is post SFAS 131 and zero otherwise. Instit is the percentage of outstanding shares held by institutional shareholders. POS is an indicator variable that takes the value of one if foreign earnings innovations are positive and zero otherwise. Full Sample refers to the entire sample period, Balanced Sample has only 4 years prior and 4 years after SFAS131 adoption observations, Fixed Sample has only firms that have data 4 years before and 4 years after SFAS 131 adoption. ***, ** and * denote significance at the 1%, 5% and 10% levels (two-sided tests), respectively.

Table 6: Effects of the Change in Number of Geographic Segments (H2) and the Inclusion of Performance Measures (H3) on the Foreign Earnings Response Coefficient in the post SFAS 131 period.

Panel A: POST SFAS 131 results (Main Results)

	ΔGSEG				PMEAS				ΔGSEG and PMEAS			
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Intercept	0.092***	5.64	0.092***	5.66	0.108***	6.30	0.108***	6.30	0.089***	4.87	0.089***	4.88
ΔGSEG	0.115***	3.03	0.116***	3.07					0.113***	2.97	0.114***	3.01
PMEAS					0.016	0.48	0.016	0.48	0.007	0.21	0.008	0.23
ΔDomEarn	0.780***	9.18	0.639***	6.92	0.786***	9.25	0.822***	8.08	0.778***	9.16	0.675***	6.36
ΔForEarn	1.821***	4.50	1.872***	4.63	1.749***	4.13	1.734***	4.09	1.230***	2.70	1.222***	2.68
ΔDomEarn * ΔGSEG			0.899***	3.85							0.959***	4.09
ΔForEarn * ΔGSEG	2.685***	3.05	2.033**	2.27					2.546***	2.89	1.799**	2.01
ΔDomEarn * PMEAS							-0.117	-0.63			-0.159	-0.85
ΔForEarn * PMEAS					2.418***	3.00	2.476***	3.05	2.262***	2.81	2.535***	3.12
N	3,663		3,663		3,663		3,663		3,663		3,663	
Adj R^2	0.043		0.046		0.040		0.040		0.044		0.048	

Panel B: PRE SFAS 131 results (Difference-in-Difference Sensitivity Analysis)

	ΔGSEG				PMEAS				ΔGSEG and PMEAS			
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Intercept	-0.015**	-2.38	-0.015**	-2.37	-0.012*	-1.77	-0.011*	-1.73	-0.012*	-1.74	-0.012*	-1.70
ΔGSEG	-0.001	-0.02	-0.001	-0.05					0.003	0.18	0.003	0.17
PMEAS					-0.019	-1.27	-0.020	-1.33	-0.020	-1.30	-0.021	-1.35
ΔDomEarn	0.779***	20.82	0.771***	19.67	0.779***	20.83	0.750***	18.88	0.779***	20.81	0.744***	18.06
ΔForEarn	1.346***	8.64	1.352***	8.66	1.269***	7.88	1.292***	8.01	1.306***	7.80	1.334***	7.94
ΔDomEarn * ΔGSEG			0.089	0.68							0.070	0.53
ΔForEarn * ΔGSEG	-0.379	-0.77	-0.429	-0.86					-0.405	-0.82	-0.442	-0.88
ΔDomEarn * PMEAS							0.254**	2.16			0.250**	2.12
ΔForEarn * PMEAS					0.261	0.65	0.122	0.30	0.273	0.68	0.137	0.34
N	7,665		7,665		7,665		7,665		7,665		7,665	
Adj R^2	0.074		0.074		0.074		0.074		0.073		0.074	
*F*ΔGSEG Diff. Test (p-value)*	3.51***(0.000)		2.80***(0.005)						3.37***(0.000)		2.55**(0.011)	
*F*PMEAS Diff Test (p-value)*					2.77***(0.005)		2.99***(0.002)		2.55**(0.011)		3.04***(0.002)	

Notes to Table 6 [

The dependent variable is UR which is annual abnormal return computed using the market model. The parameters of the market model are estimated over the 36 months preceding the current fiscal year using value-weighted market returns. The monthly returns are cumulated starting the fourth month after the previous fiscal year end month and ending three months after the termination of the current fiscal year. ΔDomEarn (ΔForEarn) is the change in per share after tax domestic (foreign) earnings scaled by the stock price at the end of the previous fiscal year. ΔGSEG is an indicator variable that takes the value one if the observation belongs to a firm that increased the number of geographic segments post SFAS 131 (zero otherwise). PMEAS is an indicator variable that takes the value one if the observation belongs to a firm that discloses at least one performance (earnings) measure post SFAS 131 (zero otherwise). F * ΔGSEG (PMEAS) Diff. test reports the t-statistic and p-value (two tailed) of a difference test between the post SFAS 131 foreign earnings interaction coefficient and the pre SFAS 131 foreign earnings interaction coefficient. ***, ** and * denote significance at the 1%, 5% and 10% levels (two-sided tests), respectively.

Table 7: **Additional Sensitivity Analyses for H2 and H3**

Panel A: Controls for foreign operations profit margin, foreign revenue percentage, firm size, and differential sales growth

	ΔGSEG		**PMEAS**		**ΔGSEG and PMEAS**	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Intercept	0.169***	2.62	0.171***	2.60	0.164**	2.50
ΔGSEG	0.127***	3.29			0.124***	3.23
PMEAS			0.021	0.59	0.012	0.33
PM	-0.015	-0.44	-0.013	-0.37	-0.013	-0.37
FShare	0.141*	1.71	0.173**	2.09	0.138*	1.67
Size	-0.021**	-2.47	-0.019**	-2.32	-0.020**	-2.43
DiffGrowth	-0.001	-1.40	-0.001	-1.40	-0.001	-1.39
ΔDomEarn	0.840***	8.13	0.851***	8.22	0.834***	8.07
ΔForEarn	3.770**	2.51	3.310**	2.16	3.159**	2.07
ΔForEarn * ΔGSEG	2.969***	3.37			2.917***	3.31
ΔForEarn * PMEAS			1.892**	2.30	1.779**	2.17
ΔForEarn * PM	0.290	0.36	0.180	0.22	0.131	0.16
ΔForEarn * FShare	-0.543	-0.32	0.029	0.02	-0.733	-0.43
ΔForEarn * Size	-0.368*	-1.71	-0.306	-1.41	-0.340	-1.58
ΔForEarn * DiffGrowth	0.107	1.03	0.108	1.04	0.105	1.01
N	2,899		2,899		2,899	
Adj R^2	0.047		0.041		0.048	

Panel B: Control for structural changes (remove firms with more than 35% change in total assets)

	ΔGSEG		**PMEAS**		**ΔGSEG and PMEAS**	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Intercept	0.095***	5.83	0.107***	6.19	0.090***	4.91
ΔGSEG	0.103***	2.69			0.099***	2.60
PMEAS			0.026	0.77	0.018	0.53
ΔDomEarn	0.705***	8.34	0.711***	8.40	0.704***	8.32
ΔForEarn	1.846***	4.58	1.721***	4.09	1.248***	2.75
ΔForEarn* ΔGSEG	2.514***	2.88			2.358***	2.69
ΔForEarn * PMEAS			2.448***	3.06	2.285***	2.85
N	3,509		3,509		3,509	
Adj R^2	0.039		0.037		0.040	

Notes to Table 7

The dependent variable is UR which is annual abnormal return computed using the market model. The parameters of the market model are estimated over the 36 months preceding the current fiscal year using value-weighted market returns. The monthly returns are cumulated starting the fourth month after the previous fiscal year end month and ending three months after the termination of the current fiscal year. ΔDomEarn (ΔForEarn) is the change in per share after tax domestic (foreign) earnings scaled by the stock price at the end of the previous fiscal year. PM is the profit margin of foreign operations. FShare is foreign revenues as percent of total revenues. Size is the logarithm of total assets. No inferences are changed if we instead use the first difference in size. DiffGrowth is the difference between year-to-year foreign sales growth and domestic sales growth (consistent with Bodnar and Weintrop 1997). The sample size for the Panel A sensitivity analysis is reduced given the need to have non-zero values for domestic and foreign sales in the previous year. ΔGSEG is an indicator variable that takes the value one if the observation belongs to a firm that increased the number of geographic segments post SFAS 131 (zero otherwise). PMEAS is an indicator variable that takes the value one if the observation belongs to a firm that discloses at least one performance (earnings) measure post SFAS 131 (zero otherwise). ***, ** and * denote significance at the 1%, 5% and 10% levels (two-sided tests), respectively.

Table 8: **Self-Selection Tests (Additional Sensitivity Analysis for H2 and H3)**

Panel A: First stage Probit models for year of SFAS 131 adoption				
	ΔGSEG		PMEAS	
	Coeff.	χ^2-stat	Coeff.	χ^2-stat
INTERCEPT	-0.217	0.054	-0.840	0.990
OWNER	-0.072	1.275	0.019	0.110
ASYMMETRY	0.250**	5.844	0.038	0.243
PIN	-0.859	0.135	2.319	1.345
LEVERAGE	0.819	1.871	-0.034	0.004
LIQUIDITY	0.096	1.552	0.016	0.048
CAPIT	0.422***	8.785	-0.007	0.023
HERF	-1.995	0.455	1.118	0.220
MB	0.059***	8.772	0.062***	9.067
ROE	-0.756	2.150	-0.162	0.095
PM_DOM	1.145	1.631	0.271	0.089
PM_FOR	0.888	2.406	-1.354**	4.778
SIZE	-0.162*	3.249	-0.047	0.355
Concordant Obs. (Discordant Obs)	72%	(28%)	65%	(35%)
Likelihood Ratio (p-value)	43.50	(0.000)	24.30	(0.013)
McFadden's R^2	0.120		0.060	

Panel B: Second stage estimation				
	ΔGSEG		**PMEAS**	
	Coeff.	t-stat	Coeff.	t-stat
Intercept	0.070***	3.96	0.100***	5.31
ΔGSEG	0.217***	4.01		
PMEAS			0.038	0.86
ΔDomEarn	0.852***	9.55	0.850***	9.50
ΔForEarn	1.714***	4.29	1.709***	4.02
ΔForEarn * ΔGSEG	2.591***	2.92		
ΔForEarn * PMEAS			1.918**	2.45
Inverse Mills Ratio	-0.119***	-2.69	-0.031	-0.79
N	3,621		3,621	
Adj R^2	0.045		0.040	

PANEL A: The dependent variable is an indicator variable that takes the value one (zero otherwise) if the firm increases the number of geographic segments or includes performance measures in geographic segment disclosures, respectively. OWNER is the industry-adjusted logarithm of the number of common shareholders, ASYMMETRY is the coefficient of variation in analysts' earnings forecasts three months before annual earnings are announced, PIN is the probability of informed trade (source: http://www.smith.umd.edu/faculty/hvidkjaer), LEVERAGE is total liabilities divided by total assets, CAPIT is industry-adjusted capital expenditures scaled by net sales, LIQUIDITY is the current ratio, MB is the ratio of market value of equity to book value of equity, PM_DOM (PM_FOR) is profit margin for domestic (foreign) operations, ROE is return on equity at firm level, HERF is the firm specific Herfindahl Index which is equal to the weighted average (weights are segments' sales) of the industry-specific index which is $\sum_{i=1}^{n}(s_i / S)^2$ (a detailed explanation is in the text), SIZE is the logarithm of firm total assets. All variables are computed in the year prior to the year of SFAS 131 adoption.

PANEL B: The dependent variable is UR which is annual abnormal return computed using the market model. The parameters of the market model are estimated over the 36 months preceding the current fiscal year using value-weighted market returns. The monthly returns are cumulated starting the fourth month after the previous fiscal year end month and ending three months after the termination of the current fiscal year. ΔDomEarn (ΔForEarn) is the change in per share after tax domestic (foreign) earnings scaled by the stock price at the end of the previous fiscal year. ΔGSEG is an indicator variable that takes the value one if the observation belongs to a firm that increased the number of geographic segments post SFAS 131 (zero otherwise). PMEAS is an indicator variable that takes the value one if the observation belongs to a firm that discloses at least one performance (earnings) measure post SFAS 131 (zero otherwise). Inverse Mills Ratios are computed using results of the first stage Probit models estimated annually post 131 adoption. ***, ** and * denote significance at the 1%, 5% and 10% levels (two-sided tests), respectively.

Table 9: **Mispricing Results (Mishkin Test)**

Nonlinear least squares regression of the relation between one-period ahead size adjusted returns and foreign and domestic current earnings changes

$$\Delta Earn_{i,t+1} = \alpha_0 + \alpha_D \Delta DomEarn_{i,t} + \alpha_F \Delta ForEarn_{i,t} + \varepsilon_{i,t+1}$$

$$AR_{i,t+1} = \beta_{71} + \beta_{72}(\Delta Earn_{i,t+1} - \alpha_0 - \alpha_D^* \Delta DomEarn_{i,t} - \alpha_F^* \Delta ForEarn_{i,t}) + \xi_{i,t+1}$$

	Pre SFAS 131		Post SFAS 131	
	Coefficient	t-statistics	Coefficient	t-statistics
α_0	-0.001	-1.63	-0.013***	-7.54
α_D	-0.188***	-12.21	-0.175***	-7.65
α_D^*	-0.137***	-2.68	-0.162*	-1.77
α_F	-0.097**	-2.11	-0.131*	-1.70
α_F^*	-0.548***	-3.57	-0.099	-0.32
β_{71}	0.002	0.22	0.031***	2.24
β_{72}	1.722***	26.83	1.922***	12.87
N	7,867		2,661	
Market efficiency tests	Chi-Squared Statistic	p-value	Chi-Squared Statistic	p-value
$\alpha_D = \alpha_D^*$	0.902	0.342	0.019	0.889
$\alpha_F = \alpha_F^*$	8.198	0.004	0.009	0.921
$\alpha_D = \alpha_D^*$ and $\alpha_F = \alpha_F^*$	8.446	0.014	0.033	0.984

Abnormal returns are computed by subtracting from the raw returns the value-weighted returns of the size decile portfolios provided by CRSP, where the size decile membership is determined at the time when returns start cumulating (i.e., three months after the fiscal year end). ΔDomEarn (ΔForEarn) is the change in after tax domestic (foreign) earnings scaled by the average total assets over the current year. Market efficiency is tested using a likelihood ratio statistic that is distributed $\chi^2(q)$ and is equal to $2nLog(SSR^c/SSR^u)$ where q is the number of constraints, n is the number of observations, SSR^c is the sum of squared residuals for the constrained system, and SSR^u is the sum of squared residuals from the unconstrained system. SFAS131 is an indicator variable that takes the value one if the observation is post SFAS 131 and zero otherwise. The F-test for Foreign Earnings tests whether the coefficient of foreign earnings post SFAS 131 is equal to zero. ***, ** and * denote significance at the 1%, 5% and 10% levels (two-sided tests), respectively.