

A Literature Review on the Value Relevance of Geographic Segment Earnings

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Abstract: The purpose of this study is to provide a comprehensive literature review about geographic segment disclosures, primarily focusing on the value relevance of foreign and domestic earnings of US multinational firms. This study demonstrates various characteristics of domestic and foreign earnings on the basis of different aspects towards the value of foreign earnings from prior studies.

Key words: Geographic segment disclosure, domestic earnings, foreign earnings, value relevance, persistence

INTRODUCTION

To gain a competitive advantages, US firms are expanding their business into unexplored foreign markets. Businesses are increasingly under the influence of the internationalization of the US economy, the globalization of the world's markets and the growth of emerging markets (Cateora and Graham, 2007).

Foreign markets offer much greater potential for growth than the relatively more exploited domestic market. Simultaneously, foreign operations tend to increase firms' exposure to global factors such as exchange rate risk, political risk, regulatory intervention, cultural differences and increased competition. These additional risks in foreign operations are likely to generate relatively higher market entry costs that is higher sunk costs than domestic markets (Denis *et al.*, 2002). Furthermore, foreign operations are likely to produce great information asymmetry or uncertainty problems compared to domestic operations as foreign operations typically operate in markets in which there is less available public information or where information is more difficult to decipher (Khurana *et al.*, 2003).

In addition, prior studies suggest that foreign operations engage in suboptimal investments that have been undertaken primarily for the benefit of management (Jensen, 1986; Christophe, 2002; Hope and Thomas, 2008). As foreign operations are not as closely monitored by investors as domestic operations, their managers have more opportunities to make self-maximizing decisions that are not aligned with the interests of the firm.

A number of researchers have shown various aspects of international diversification by examining the value of the US multinational firms. The purpose of the present study is to provide a comprehensive literature review that

examines the benefits and costs of international diversification, specifically focusing on a comparison between domestic and foreign earnings attributes. The remainder of this study includes a discussion of geographic segment disclosure standards in the US and introduces prior studies various topics associated with earnings attributes such as value relevance and persistence. Finally, the study presents empirical descriptive statistics of domestic and foreign earnings and concludes the study.

DISCLOSURE OF SEGMENTAL INFORMATION IN THE US

Under the SFAS (Statement of Financial Accounting Standards) No. 14 financial reporting for segments of a business enterprise, firms were required to disclose segment information about their line-of-business and geographic area with no specific link to the internal organization of the company. Specifically, it required firms to disclose revenues, assets, capital expenditures, depreciation and earnings by line-of-business as well as geographic segment if the segment revenues, assets or earnings exceeded 10% of the consolidated amounts. It was generally agreed, however that geographic segment earnings disclosures were not useful owing to the flexibility in applying segment definition criteria, resulting in a lack of comparability and consistency both across firms and over time for the same firm. In addition, financial analysts as sophisticated information users argue that financial statement information should be more disaggregated (Thomas, 2000). To address the questions and concerns regarding geographic segment disclosures under SFAS No. 14, the FASB (Financial Accounting Standard Board) issued SFAS No. 131 disclosures about

segments of an enterprise and related information, effective for the periods beginning after December 15, 1997. SFAS No. 131 fundamentally changed the manner in which firms provide segment information. Segment information is reported in a manner consistent with the way management organizes the firm internally to make operational decisions and assess performance. Firms do not need to disclose earnings according to both their line of business and geographical area but they are required to disclose by operating segment only. Operating segments may include products or services, geographic areas, legal entities or types of customers. The key objective of this, new disclosure standard is to provide investors and other financial statement users a means to see the company through the eyes of management (Herrmann and Thomas, 2000) thus, enhancing the usefulness of the financial information.

Herrmann and Thomas (2000) show how US firms respond to the new disclosure rule SFAS No. 131 and present evidence of the following; over two-third of the sample firms have redefined their primary operating segments upon adopting SFAS No. 131, there has been an increase in the number of firms providing segment disclosures and companies are disclosing more items for each operating segment. Furthermore, the proportion of country-level geographic segment disclosures showed an increased while the proportion of broader geographic area segment disclosures has decreased. However, the number of firms reporting earnings by geographic area has declined greatly as disclosing this item is no longer required for firms reporting on a basis other than geographic area.

As discussed earlier, SFAS No. 131 allows firms to have the option of whether to disclose geographic earnings when operating segments are defined on any basis other than the geographic area. Hope and Thomas (2008) argue that the nondisclosure of segment information by geographic area under SFAS No. 131 potentially reduces the ability of shareholders to monitor managers decisions related to foreign operations. Hope and Thomas also examine whether the non-disclosure by geographic area affects the financial reporting behavior of US multinational firms. They find that non-disclosing firms, relative to firms that continue to disclose geographic earnings, experience greater expansion of foreign sales, produce lower foreign profit margins (profit margin is calculated by net income divided by sales) and have a lower firm value only in the post-SFAS 131 periods. They find no evidence of differences in firm values in the year prior to adoption of SFAS 131. Importantly, they do not find a similar pattern in firm performance for domestic operations in the post-SFAS

131 periods or for foreign operations in the pre-SFAS 131 periods. These results imply that non-disclosures of geographic earnings reduce the monitoring of managerial actions and that the managers then become more willing to expand their international operations (i.e., build an empire) despite the fact that such actions lead to lower firm performance. The study of Hope and Thomas (2008) contributes to the existing literature by providing empirical evidence on of the agency cost hypothesis in the context of geographic earnings disclosures.

VALUE RELEVANCE OF FOREIGN AND DOMESTIC EARNINGS

Kinney Jr. (1971) show that the number of foreign segments increases the market risk. Balakrishnan *et al.* (1990) argue that geographic segment disclosures are less likely to be associated with future annual income and sales using the segment disclosure data under SFAS No. 14. Boatsman *et al.* (1993) investigate the use of geographical segment disclosures, specifically examining whether equity valuations of US multinationals are affected by the geographical segment disclosures mandated by SFAS No. 14. They suggest that geographical segment disclosures are used when unexpected segmental earnings are large however, general little evidence has been presented that these disclosures affect equity values.

Bodnar and Weintrop (1997) investigate the value relevance of domestic and foreign earnings with a larger sample using SEC regulation 210.4-08 (h) data (the source of segment data to compute domestic and foreign earning is Securities and Exchange (SEC) regulation 210.4-08 (h)). The data were 1st included in compustat in 1984 of US multinational firms thus, leading to more powerful results. Specifically, they examine the association between annual abnormal stock return and changes in firms' domestic and foreign incomes using 2, 570 firm-year observations from 1985-1993.

Unlike extant studies before 1997, Bodnar and Weintrop find that Earnings Response Coefficients (ERC) of foreign earnings are significantly higher than those of domestic earnings, implying that foreign earnings are capitalized into the stock price at a significantly higher rate than domestic earnings changes. This suggests that the market views foreign and domestic income changes differently for the purpose of firm valuation. In addition to the US domiciled markets of the sample of US multinational firms, Bodnar *et al.* (2003) investigated Australian, Canadian and British domiciled markets and find results identical to those noted for US markets. While Bodnar and Weintrop (1997) and Bodnar *et al.* (2003)

examine the value relevance of earnings attributes. Thomas (1999) investigates the persistence of domestic and foreign earnings. Thomas (1999) finds that foreign earnings are more persistent than domestic earnings in accordance with the higher value relevance of foreign earnings. In addition, Thomas shows that market does not fully incorporate the higher persistence of foreign earnings. In other words, investors discount the value of foreign earnings which implies the mispricing of foreign earnings. Thomas suggests that a poor information environment in foreign operations is likely to cause mispricing of foreign earnings but fails to provide evidence of why investors underestimate foreign operations.

Consistent with the view of Bodnar and Weintrop (1997) and Hines Jr. (1996) argues that US firms earn a significant share of their profits from foreign sources, out of which they appear to pay dividends at rates that are three times higher than their payout rates from domestic profits. This suggests that foreign earnings are more important than domestic earnings in terms of dividend payments.

Christophe (2002) investigates whether the stock returns associated with changes in domestic and foreign earnings vary depending upon the sign of the change. Evidence shows that negative foreign (vs. domestic) earnings changes are associated with significantly larger stock returns. In contrast to negative earnings changes, positive foreign and domestic earnings changes are associated with statistically indistinguishable returns. Thus, it concludes that the greater ERC associated with foreign earnings changes is due primarily to a large negative price response associated with negative foreign earnings changes.

Christophe and Pfeiffer (2002) examine how international operations are reflected in the value of US Multinational Corporations (MNCs) during the 1990s. They use the sample period from 1990-1994 and employ Tobin's q as a proxy for firm value and each segment sales measure instead of earnings data while controlling for R and D expenses, Advertising expenses, leverage and other variables. They find that investors do not value international operations as highly as domestic operations and geographic region disclosures (i.e., Europe, Africa and Asia) are not useful for conveying information about the specific location and magnitude of the firm's operations. Using a relatively large sample of 44, 288 firm years between 1984 and 1997, Denis *et al.* (2002) investigate the effect of the international (global) and industrial diversifications on firm value and the relationship between international diversification and industrial diversification. They show that increases in

global diversification reduce excess value while reductions in global diversification increase excess value thus supporting the view that the costs of global diversification outweigh the benefits.

Callen *et al.* (2005) examine the importance of foreign earnings relative to domestic earnings for a sample of US multinationals. In particular, they investigate the ability of domestic and foreign earnings to explain the variance of unexpected stock returns by employing the methodology of variance decomposition.

The explanation by Callen *et al.* (2005) suppose that the covariance between unexpected Returns and Foreign Earnings ($Cov.(Ret, FE)$) is 0.2, the covariance between unexpected Returns and Domestic Earnings ($Cov.(Ret, DE)$) is 0.6, the Variance of Foreign Earnings ($Var.(FE)$) is 0.1 and the Variance of Domestic Earnings ($Var.(DE)$) is 0.4. Assuming that the covariance between domestic and foreign earnings is zero, a regression of unexpected returns on foreign and domestic earnings components will yield ERC values of 2 and 1.5, respectively.

The ERC of foreign earnings is greater than the ERC of domestic earnings because foreign earnings are more persistent than domestic earnings. What if foreign earnings shocks are infrequent relative to domestic earnings shocks or do not occur at all? Then no matter how sensitive returns are to foreign earnings, foreign earnings will not drive stock returns. Indeed in this example, domestic earnings are four times more volatile than foreign earnings any change in returns is more likely to be driven by domestic earnings than by foreign earnings even though returns are 33% more sensitive to foreign earnings shocks than domestic earnings shocks. They argue that variance decomposition and value relevance (ERCs) are complementary.

The overall relationship between unexpected returns and the foreign and domestic earnings components depends on the sensitivity of the return to each Earnings Component (ERCs), the sensitivity of return variability to the variability of each earnings component. They report that domestic earnings are more volatile than foreign earnings.

Therefore, they indicate that on average, although foreign earnings are more persistent than domestic earnings, the greater variance of domestic earnings results in domestic earnings contributing more to the variability of unexpected stock returns. In sum, domestic earnings are more important in explaining the variance of unexpected returns than are foreign earnings. Furthermore, they show that the relative importance of domestic earnings is likely to decrease when investors are more sophisticated.

Therefore as shown in Callen, Hope and Segal, the value relevance needs to be considered both in terms of variance effects and mean effects to understand the return distribution. ERCs and variance decompositions are complementary pieces of information.

EMPIRICAL RESULTS

The various statistical results are presented to help assist with an understanding of the characteristics of foreign and domestic operations. Table 1 shows a variety of properties of domestic and foreign operations. In Table 1, the segment sales show that the domestic sales amounting to \$618 million are nearly identical to foreign sales amounting to \$614 million. The segment assets of domestic and foreign operations have on average a balance of \$1,108 million and \$542 million, respectively, suggesting that the size of domestic operations in terms of sales and assets is on average more than twice that of foreign operations.

Figure 1 shows that the domestic Earnings per Share (EPS) deflated by the beginning price is significantly higher than the foreign EPS over the sample period. The statistical results show that the mean (median) domestic EPS and foreign EPS (deflated by price) are -0.011

(0.035) and 0.018 (0.011), respectively. While domestic EPS is negatively skewed, foreign EPS is positively skewed. The time series pattern of the segment EPS shows a gradually declining trend for domestic EPS while showing relatively stable results for foreign EPS. More importantly, the standard deviations of domestic pretax income and foreign pretax income are 829 and 577, respectively suggesting that domestic income is more volatile which is consistent with the findings of Callen *et al.* (2005). As shown in Fig. 2, the volatility of domestic EPS is highest in 2002 when the median domestic EPS is lowest.

Asset turnover represents a measure of operating efficiency which compares the sales volume with a company’s investment in assets. Higher asset turnover means that a company effectively utilizes their assets to generate revenue. Table 2 and Fig. 3 show the asset turnover of domestic and foreign operations. The mean (median) domestic and foreign asset turnover values (segment sales divided by segment assets) are 1.167 (1.039) and 1.477 (1.306), respectively suggesting that foreign asset turnover is higher than domestic asset turnover (with a z-value of 41.16). Thus, foreign assets are more efficiently managed with a lower level of assets than domestic assets. Return On Assets (ROA) comparing income to total assets represent a measure of profitability

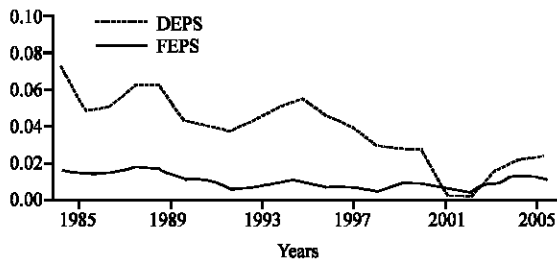


Fig. 1: Median of domestic and foreign income; DEPS (FEPS) represents domestic EPS and foreign EPS calculated by domestic (or foreign) pretax income divided by the number of shares, deflated by the beginning price of year t (data #272 or data #273/data #25)/lag (data #199)

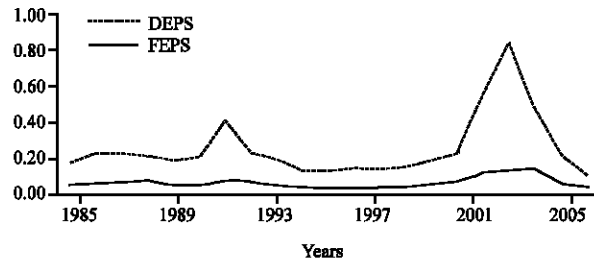


Fig. 2: Standard deviation of domestic and foreign income; DEPS (FEPS) represents domestic EPS and foreign EPS, calculated by domestic (or foreign) pretax income divided by the number of shares, deflated by the beginning price of year t (data #272 or data #273/data #25)/lag (data #199)

Table 1: Segmental sales and long-lived assets of Domestic Operation (DO) and Foreign Operations (FO), respectively. The data covers the period from 1984-2005

Statistical methods	Sales (million)		Assets (million)		Pretax income (million)	
	DO	FO	DO	FO	DO	FO
Mean	618.300	613.500	1,108.600	541.900	115.200	88.200
Median	63.900	60.400	149.000	28.500	7.150	3.780
SD	1.843	1.905	2.974	2119.000	829.400	577.500
Q1	10.000	12.100	32.110	2.880	-2.470	0.060
Q3	356.300	331.400	707.700	213.000	57.000	28.800
No. of obs.	136.348	46.549	41.523	34.137	32.882	32.024

North America Compustat Annual and Segment File; pretax income represents both the domestic and foreign pretax income (data #272 or data #273), respectively

Table 2: ROE, ROA and Asset turnover of Domestic Operations (DO) and Foreign Operations (FO) as calculated using the data from 1984-2005

Statistical methods	Asset turnover		ROA		ROE	
	DO	FO	DO	FO	DO	FO
Mean	1.167	1.477	0.038	0.079	0.047	0.037
Median	1.039	1.306	0.058	0.082	0.086	0.022
SD	0.800	1.000	0.191	0.189	0.464	0.158
Q1	0.571	0.864	-0.020	0.015	-0.027	0.000
Q3	1.571	1.800	0.135	0.160	0.198	0.077
No. of obs.	33.035	23.420	15.714	15.973	35.098	34.258

North America Compustat Annual and Segment File; ROE represents domestic or foreign pretax income (data #272 or data #273) divided by the book value of equity (data #60); ROA (D_ROA or F_ROA) represents domestic or foreign pretax income (data #272 or data #273) divided by the average domestic or foreign assets; asset turnover is computed by means of domestic (or foreign) sales divided by average domestic (or foreign) assets

Table 3: ROE, ROA and Asset turnover of both Domestic Operation (DO) and Foreign Operations (FO) as calculated using the data from 1984-2005

Statistical methods	Sales growth		Asset growth		Profit margin	
	DO	FO	DO	FO	DO	FO
Mean	0.109	0.149	0.074	0.128	-0.033	0.052
Median	0.077	0.112	0.047	0.091	0.045	0.060
Std. Dev.Stdev	0.393	0.451	0.363	0.427	0.588	0.199
Q1	-0.041	-0.035	-0.065	-0.051	-0.030	0.007
Q3	0.232	0.291	0.182	0.270	0.116	0.126
No. of obs.	112.395	39.840	33.002	23.608	29.824	24.191

North America Compustat Annual and Segment File; sales growth (D_SGROW or F_SGROW) is computed by the log difference in domestic (or foreign) sales between year t and year t-1; asset growth (D_ATGROW or D_ATGROW) is computed via the log difference in domestic (or foreign) assets between year t and year t-1; profit margin represents domestic (or foreign) pretax income (data #272 or data #273) divided by average domestic (or foreign) sales

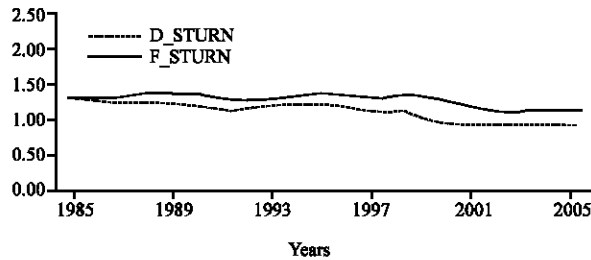


Fig. 3: Median of asset turnover of domestic and foreign operations; D_STURN (F_STURN) represents asset turnover, calculated by domestic (or foreign) sales divided by average domestic (or foreign) assets; D_ROA (F_ROA) represents return on assets, calculated by domestic (or foreign) pretax income divided by average (or foreign) assets at year t

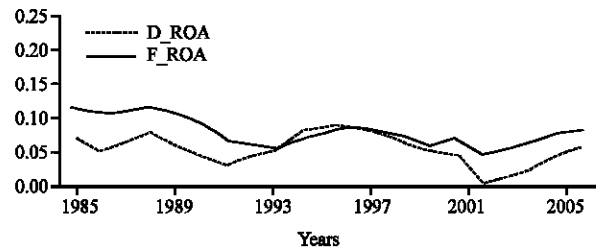


Fig. 4: Median of return on assets of domestic and foreign operationoperations; D_STURN (F_STURN) represents asset turnover, calculated by domestic (or foreign) sales divided by average domestic (or foreign) assets; D_ROA (F_ROA) represents return on assets, calculated by domestic (or foreign) pretax income divided by average (or foreign) assets at year t

(Fig. 4). Many analysts consider ROA to be a better measure, compared to return on equity of management's ability to utilize assets effectively as ROA is not affected by the way in which the assets are financed. Mean (median) domestic and foreign ROA (pretax income to average segment assets) values are 0.038 (0.058) and 0.079 (0.082), respectively. These two values of asset turnover and ROA suggest that domestic operations maintain a larger scale of assets and generate more sales than foreign operations whereas, foreign segment profitability measuring asset turnover and ROA is on average higher than domestic profitability. Foreign operations produce greater outputs (higher earnings) relative to their input (assets, etc.) and grow faster than domestic operations in

that foreign assets and sales are on average growing more rapidly over time. In addition, Table 3 shows several growth variables including sales growth, asset growth and the profit margins of domestic and foreign operations. The statistical results show that on average, foreign operations grow faster than domestic operations. This is supported by the findings of Bodnar and Weintrop (1997) documenting higher growth opportunity in foreign operations. In sum, the empirical results show that domestic earnings are on average higher than foreign earnings, domestic earnings are much volatile than foreign earnings, foreign assets are more effectively managed than domestic assets and foreign operations are growing faster than domestic operations.

CONCLUSION

This study provides a literature review of studies pertaining to geographic segment earnings, specifically focusing on the disclosure standard and the value relevance of earnings attributes using evidence from US multinationals. First, this study compares the differential disclosure standards, SFAS 14 vs. SFAS 131 and introduces prior studies dealing with the issuance of standards. Under SFAS 14, firms were required to disclose segment information about their line-of-business and their geographic area with no specific link to the internal organization of the company. The flexibility in applying the segment definition criteria resulted in a lack of comparability and consistency both across firms and over time for the same firm. Under SFAS 131, segment information is reported consistent with the manner in which management organizes the firm internally when making operating decisions. In other words, it is disclosed by operating segment only. More importantly, prior studies show that the number of firms reporting earnings by geographic area has declined greatly as disclosing this item is no longer required for firms reporting on a basis other than geographic area under SFAS 131. This non-disclosure of foreign earnings has the potential to reduce the ability to monitor managers' decisions related to foreign operations thus, causing agency problems (Hope and Thomas, 2008). Second, the prior studies show contradictory findings with regard to the value of foreign earnings and domestic earnings. Some studies present evidence that the value of foreign operations is greater (Bodnar and Weintrop, 1997; Christophe, 2002) whereas other studies demonstrate a discounted value of foreign operations (Boatsman *et al.*, 1993; Denis *et al.*, 2002; Christophe and Pfeiffer, 2002). Prior studies also show that the greater value relevance of foreign earnings is primarily due to the negative changes in foreign earnings as opposed to positive changes (Christophe and Pfeiffer, 2002). In addition, foreign earnings are less volatile than foreign earnings thus, generating domestic earnings contributes more to the variability of returns than foreign earnings (Callen *et al.*, 2005). This is consistent with the findings of Thomas (1999) who finds that investors underestimate the persistence of foreign earnings. As a further study, researchers need to revisit the value relevance and persistence of foreign earnings to clarify the aforementioned contradictory evidence discussed in this study.

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