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# Diversification and Performance Measurement Problems: An International Investigation

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## ABSTRACT

*The importance of performance in the strategy literature is widely accepted among scholars and practitioners. However, the proxies for performance and diversification that have been employed in past strategy research has not been unanimously agreed upon. Given the current state of confusion that exists with regard to the topic of diversification, performance and its relationship within an international context, the present paper seeks to add to this body of knowledge and help resolved some discrepancies.*  
**Keywords:** *Diversification, Firm Performance, International Diversification*

## INTRODUCTION

The importance of performance in the strategy literature is widely accepted among scholars and practitioners (Dess, Gupta, Hennart, and Hill, 1995). However, the measurement of performance and diversification has been fraught with inconsistencies and contradictions. The diversity of performance measures being used in research studies has continued to fan the flames of confusion. Given the current state of confusion that exists with regard to the topic of diversification and its relationship with performance, the study of diversification continues to be a source of frustration for those trying to make sense of the plethora of studies (Dess, Gupta, Hennart, and Hill, 1995). Additionally, the variety of methods being used to measure diversification has contributed significantly to the current state of confusion in the strategy literature (Robins and Wiersema, 2003). In an effort to allay some of these concerns, the present study represents an empirical study of a variety of commonly used measures of firm performance and diversification within the context of an international sample. Varying results highlight the differences across countries, and alternative measures of performance and diversification.

Although Dess, Gupta, Hennart, and Hill (1995) have suggested that the diversification-performance linkage is the single most researched topic in the strategy literature, their assessment of the research findings has lead them to conclude that "We know very little." (Dess et al., 1995) What we do not understood up to this time is why, given the vast amounts of studies conducted on the subject, can't we more clearly articulate the effects of diversification on performance? Is it because the diversification construct itself is so slippery and hard to measure? Or does the confusion stem from the operationalization of firm performance? How much impact do performance measures have on the outcome of a research study? In addition to these issues, are the findings in the strategy literature applicable to other countries? Or are the extant findings limited to U.S. firms?

## FIRM PERFORMANCE DISCREPENCY

As is true of all research, it should be noted that the results of strategic management studies are measure specific. Results of empirical studies will be impacted by the proxies utilized to measure the

variables being studied. The vast array of research suggests utilizing accounting-based measures of performance have suggested that diversification can lead to improved performance. On the other hand, studies assessing the value of firm performance using market-based measures report positive or no relationship between diversification and performance. Despite the accusations that have been levied against accounting-based measures of performance they continue to be the most commonly used proxies of performance. This over reliance on accounting-based measures of performance may have unduly influenced the conclusions currently accepted in the strategy literature.

Accounting-based measures of performance in general, and profit-based measures of performance in particular, have long been widely accepted as valid measures of firm performance ((Bettis, 1981; Bettis and Hall, 1982; Montgomery, 1982; Palepu, 1985; Rumelt 1974; 1982). Within the boundaries of the diversification literature several commonly accepted accounting-based measures of performance have become standards for comparison. Whether the measures are used in isolation or in conjunction with each other, the most frequently utilized measures of performance are return on assets (ROA), return on equity (ROE), and return on sales (ROS) or some variation of these measures. A review of the strategy literature reveals that these few measures are indeed the most commonly employed means of assessing a firm's performance.

Given the previous discussion, the use of accounting-based measures has been and continues to be considered valid and reliable measures of performance within the strategy literature. However, within the domain of accounting-based performance measures a great division exists concerning which measure to use. The plethora of accounting measures has resulted in wide variations and inconsistent findings within the field of diversification. The relationship among strategy types and performance measures has not been studied. Instead, the strategy/ performance relationship has been assumed to be unbiased or neutral and is ignored in the diversification literature.

On the other hand, it has been argued recently that a market-based approach is more accurate in measuring firm performance. Researchers opting for the market-based measures of performance suggest that such measures incorporate both the shareholders' and industry's evaluation of a firm's future performance. Since the measure is forward looking, i.e. an evaluation of a firm's future potential, it is argued that such measures are a more realistic valuation method for determining a firm's value. It is argued that such a valuation method is more indicative of the process utilized in determining stock price. The most common measurement technique used in evaluating a firm's value is the market-based system known as the capital asset pricing model (CAPM). However, CAPM suffers from its own problems, namely that it is not very easy to calculate.

In an attempt to combine the benefits of both market-based and accounting-based measures of firm performance Stern Stewart and Co. has introduced two indexes commonly known as economic value added (EVA) and market value added (MVA). The calculation of these measures allow for the use of commonly available accounting-based data and the inclusion of more market-based data like the CAPM without all of the inherent complexities. EVA and MVA measures are accepted as market-based measures of performance, which can be easily obtained. The basic tenet of EVA and MVA is that businesses should not invest in businesses, projects, or activities unless they can generate a profit over and above the cost of capital. The foundation for these measures is that the cost of capital has been ignored by traditional profit-based measures and is indirectly factored into the CAPM. Assuming that the primary goal of most businesses is to create wealth for their shareholders, the cost of capital becomes a critical factor in determining the assessment of shareholder wealth, and therefore, it has been proposed that EVA/MVA may be a more accurate measure for assessing firm wealth (Stern, 1994).

According to the late Roberto Goizueta (past CEO of Coca-Cola), when asked about MVA, he stated that: "It's *the only way* to keep score. Why *everybody* doesn't use it is a mystery to me." (Tully, 1994, p.143, emphasis added). MVA has been touted as the best way for evaluating how well a firm creates shareholder wealth (Tully, 1994). Others have acclaimed EVA/MVA as "Today's hottest financial idea and getting hotter." (Tully, 1993, p. 24). As is succinctly pointed out by Tully (1994):

...accounting measures are seriously flawed, focusing solely on the returns obtained from company investments. To pass judgment as to whether a firm has indeed created economic or market value, requires a comparison of the cost of capital and the resulting returns. It is argued that the cost of capital is a critical and necessary component in determining how efficiently capital has been utilized, which is not reflected in the "typical" accounting-based measures. (p. 162)

It has been propounded by Stern Stewart that traditional accounting-based measures, which are the most frequently used proxies of firm performance in the strategy literature, make the implicit assumption that the cost of capital is zero. Traditional accounting-based measures ignore the cost of raising capital through the use of equity. In comparison to generating capital via the use of debt, equity may erroneously be viewed as a source of free capital. Since there are no mandatory interest payments to be made, equity may be erroneously viewed as a windfall. However, the theory behind EVA/MVA argues that all capital comes at a cost and this cost needs to be factored into any evaluation of a firm's profitability.

It is argued that the all-to-frequent assumption that all performance measures are created equal and therefore, are all unbiased proxies of firm performance is a dangerous one. Instead, it is argued that the results of previous strategy research may be by-products of the type of measures used to operationalize performance. Therefore, performance measures and their relationships with different strategy types will vary depending on the performance measure used. Due to the unique composition of these performance measures the conclusions of previous diversification studies may have led to spurious conclusions, which have retarded the development of the field of strategy.

Given the wide variety of possible measures of firm performance that are readily available, the three most commonly utilized measures of performance (ROA, ROE, ROS), along with EVA, and MVA and their relationship with diversification will be investigated. Since this is an exploratory study of performance measures no a priori hypotheses have been proposed, other than to say that it is expected that there will be significant differences among the various proxies of performance, countries, and measures of diversification. Further, it is expected that there will be significant differences between traditional accounting-based measures of performance (ROA, ROE, ROS) and market-based measures of performance (EVA and MVA).

#### DIVERSIFICATION DISCREPENCY

Keats (1990), in a review of the strategy literature, expressed her suspicion regarding the performance/strategy relationship when she stated that:

...diversification and performance are multidimensional constructs and...identification of appropriate criteria for *performance assessment depends on the strategy pursued*. (emphasis added, p. 61)

Clearly, Keats is advocating that more attention and detail be paid to the selection of performance variables in research studies. As is suggested by Keats (1990), the possibility of unexpected interactions between various performance measures and different strategy types could lead to erroneous conclusions. Could it be that researchers have inadvertently biased their results by adopting measures of performance that unduly reflect the benefits or idiosyncrasies of certain strategies, while downplaying the strengths of

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other strategies? It seems clear from the comments of Keats (1990) that if we are to accurately assess organizational performance it is imperative that multiple measures be employed by strategy scholars. The suggestion provided by Keats (1990) highlights the likelihood of contingent strategy/performance relationships that have been ignored in previous research studies.

In general, strategy scholars believe that relatedness across lines of business will result in better performance than unrelated diversification (e.g., Bettis, 1981; Bettis and Mahajan, 1985; Rumelt, 1974, 1982; Varadarajan and Ramanujam, 1987), although such a conclusion has been questioned by a variety of scholars (e.g., Amit and Livnat, 1988; Bettis and Hall, 1982; Dubofsky and Varadarajan, 1987; Palepu, 1985). Such discrepancies can sometimes be blamed on the different perspectives and methodologies used by researchers (Harrison, Hall, and Nargundkar, 1994; Hoskisson and Hitt, 1990; Montgomery, 1979; Venkatraman, 1989).

The operationalization of diversification has been fraught with inconsistencies and dissension since its inception. Discussions and discrepancies over the inconsistencies among the various methods of assessing diversification have received a great deal of attention (Hall and St. John, 1994; Hoskisson and Hitt, 1990; Hoskisson, Hitt and Moesel, 1993; Robins and Wiersema, 2003). After a review of all of the extant findings concerning the matter of construct validity, diversification still continues to generate discussion and study (Robins and Wiersema, 2003).

The bulk of research has opted for the entropy measure of diversification (Palepu, 1985). However, the Herfindahl and concentric (Montgomery and Hariharan, 1991; Robins and Wiersema, 2003) indexes have also been proposed as easy to use measures of a firm's overall level of diversification. In a recent article by Robins and Wiersema (2003) the concentric measure of diversification was found to be a more conservative and accurate measure of diversification than the entropy index. One possible explanation for such findings is that the indexes are assessing different aspects of the diversification construct (Hall and St. John, 1994).

In support of such an argument the interchangeableness of these common indexes is being questioned by Robins and Wiersema, who argue that:

...the measures do not capture exactly the same dimensions of portfolio strategy. Although they often have been viewed as alternative approaches to the common problem of measuring related diversification, the measures can produce contradictory results because they differ in their sensitivity to underlying dimensions of portfolio strategy. (2003; p. 43)

So, the issue of which measure of diversification is more accurate in assessing a firm's level of diversification has not been settled. In order to test the effectiveness of the various diversification indexes it is necessary to incorporate multiple measures within the boundaries of a single study, where the results can be compared and evaluated. Only by comparison can the usefulness of the different proxies for diversification be truly assessed.

## DIVERSIFICATION FROM A GLOBAL PERSPECTIVE

The vast majority of diversification studies that have been conducted to date have adopted what can be called an *American perspective* (Geringer, et al., 2000). The adoption of such a perspective can be seen throughout the strategy literature and has had a tendency to retard the development of the diversification construct. The generally accepted typology relies on assessing the relatedness across lines of business in a corporate portfolio to determine diversification. Adopting such a typology has been widely concluded that firm performance is positively correlated with relatedness across businesses within

a firm's business portfolio (Rumelt, 1974, 1982).

It can be argued that the time is long past for viewing diversification from such a limited perspective and that the global nature of business has rendered such a perspective inept (Hitt, et al. 1997). Given the rapid advances being made in technology and the evaporation of long held ideological differences across countries we are increasingly moving toward one globalized market. Based on the changing circumstances in the world, it is imperative that we broaden and redefine our understanding of the diversification construct. From a multinational (market) based view of diversification issues concerning diversifying into new countries and across international borders are becoming an every increasing important topic in the field of strategy.

Although multinational diversification has attracted more attention over the past decade or so (Eun and Resnick, 1994; Karpik and Riahi-Belkaoui, 1994; Geringer, Beamish, and daCosta, 1989) results have been inconsistent at best. Even though the results have been inconclusive, previous studies unanimously suggest that the multinational (or market) diversification strategy is an important factor in determining a firm's performance. Porter (1990, 1991) strongly argues that the adoption of a global perspective of strategy can become a direct or indirect source of competitive advantage by allowing firms to take their products overseas. Strategies that involve the transference of successful competencies that have been developed domestically to overseas markets are believed to have a greater chance of success when penetrating foreign markets. Therefore, multinational diversification provides an opportunity to outperform domestic industries.

Multinational diversification may very well be the heart of firm performance in the future (Porter, 1990, 1991). Regardless of the findings of past research studies, the importance of such research highlights the increasing frequency in which firms are engaging in multinational diversification. Given the importance of international markets to the survival of many companies the need to understand more fully the intricacies of multinational diversification is clear.

## METHODOLOGY

### Sample

The initial sample was drawn from the *Stern Stewart Performance 1,000* for the year 2001. The primary reason for using the Stern Stewart data in forming the initial sample was that EVA and MVA measures were calculated by Stern Stewart, who is widely regarded as the authority on such measures. In addition to using the *Stern Stewart Performance 1,000* as a data source, additional data was collected from Stopford's *Directory of Multinationals and Compact-D Worldscope* (2001). All additional information was collected from company annual reports. Due to incomplete data the final sample was made up of a total of 172 U.S. firms and 102 Japanese firms.

### Measurement of Variables

All variables used in the study were calculated as five-year averages. Given that the variables studied in this research will fluctuate from year-to-year, it was decided to use five-year averages to eliminate any yearly biases. By using five-year averages it was possible to obtain a more stable and hopefully, a more accurate measure of a firm's diversification strategy and its influence on firm performance.

### Performance Measures

In an attempt to insure the comparability of the results of the present study across a broad range of research studies in the diversification literature, the decision was made to include both accounting- and market-based measures of performance. First, three measures of accounting-based performance were included in the study and are measured in the following fashion:

$$\text{ROA} = (\text{Net profit after-tax}) / (\text{Total assets})$$

$$\text{ROE} = (\text{Net profit after-tax}) / (\text{Common stockholders Equity})$$

$$\text{ROS} = (\text{Net profit after-tax}) / (\text{Sales})$$

Second, two market-based measures of firm performance, which more fully reflect investor expectations about the future profits of an organization were included as measures of firm performance. The market-based measures utilized in this study include economic value added (EVA) and market value added (MVA). The market-based measures of performance were obtained from Stern Stewart (2001) and were calculated as follows:

$$\text{EVA} = \text{net operating profit after tax} - \text{cost of capital}$$

$$\text{MVA} = \text{company's total market value (= debt + equity)} - \text{book value of company}$$

### Diversification Variables

Two different categories of diversification measures were used in the present study: product- and international or market-based diversification. Within each of these general diversification types two methods were used to calculate and assess diversification: entropy (Palepu, 1985) and concentric (Montgomery and Hariharan, 1991; Robins and Wiersema, 2003). The inclusion of the concentric index of diversification has been suggested by Robins and Wiersema (2003) to be a more accurate measure of diversification than previously employed measures and therefore, represents the most up-to-date measure available. The extension of the concentric index to incorporate and measure international diversification is unique to the present study and if offered as a potential new way to gain insight into the burgeoning field of international business. In a comparison of continuous measures of diversification, Robins and Wiersema (2003) concluded that the concentric index is a more valid indicator of diversification than previously used proxies.

### Product Diversification

Although there are a variety of different measures of product diversification we choose to limit our study to the most commonly used continuous measures of diversification. Therefore, product diversification was operationalized using the entropy index (Palepu, 1985). This measure of product diversification represents the most commonly used continuous measure of diversification in the strategy literature and have been found to be both a reliable and valid measure of diversification. The measure evaluates the relative contribution of the major product/business segments of a firm to overall firm sales. The entropy measure of product diversification was calculated using the following formula:

$$\text{PDVSF-Entropy} = 1 - (\text{SP}_i / \text{TS}_i)$$

where:

$$\text{SP}_i = \text{sales volume of the major product in year } i$$

$$\text{TS}_i = \text{total sales of the firm in year } i$$

The concentric index of product diversification is represented by the equation:



$$PDVVSF\text{-Concentric} = \sum_{i=1}^N P_i (1 - \sum_{i=1}^N P_i)$$

where:

$P_i$  = Percentage of sales from industry  $i$  by 2 digit SIC code.

An index value of zero indicates that a firm is not diversified. On the other hand an index greater than zero indicates varying levels of product diversification. The greater the index the more diversified the firm.

### Market Diversification.

Market or multinational diversification was measured as the proportion of a firm's sales revenue derived from overseas markets (i.e., foreign operations and export volume; Geringer et al., 1989; Grant et al., 1988; Rugman, 1994; Wolf, 1975).

$$MKDVSF\text{-Entropy} = 1 - FS_i / TS_i$$

where:

$FS_i$  = international sales volume in year  $i$

$TS_i$  = total sales of the firm in year  $i$

Extending the concentric index of product diversification (Montgomery and Hariharan, 1991; Robins and Wiersema, 2003) to international diversification leads to the following calculation:

$$MKDVSF\text{-Concentric} = \sum_{i=1}^N P_i (1 - \sum_{i=1}^N P_i)$$

where:

$P_i$  = Percentage of international sales from industry  $i$  by 2 digit SIC code.

Similar to the product diversification index, the multinational diversification indexes reflect increasing levels of international sales; the higher the index's value the greater the level of activity in doing business abroad.

### Control Variables.

Since firm performance and diversification can be influenced by a variety of variables outside the scope of the present study it was deemed necessary to control for certain potential confounding variables. Based on the results of previous research on diversification we included several control variables that have been identified as potentially important variables in explaining firm performance (Chatterjee and Wernerfelt, 1991; Lang and Stulz, 1994; Tallman and Li, 1996). The control variables incorporated in the present study include:

Firm Size =  $\ln(\text{Sales})$

RandD Intensity =  $\text{RandD expenditure} / \text{Total sales}$

Capital Intensity =  $\text{Total Assets} / \text{Total Sales}$

Debt Leverage =  $\text{Total Debt} / \text{Shareholder's Equity}$

## Statistical Methods

A series of hierarchical regression was used to investigate the relationship between diversification and firm performance among U.S. and Japanese firms. First, the control variables were entered in stage one of the regression. The control variables and their effects on firm performance were separated from the variables being investigated in order to be able to provide a more rigorous test of the central variables under study. By eliminating the effects of the control variables first it is possible to more accurately assess the true impact of diversification on firm performance. Second, the diversification measures were entered in the second stage of the regression.

## RESULTS AND DISCUSSION

General statistics and correlation coefficients for the variables included in the present study are reported in Table 1 for Japanese firms and Table 2 for U.S. firms. After reviewing the intercorrelations several interesting relationships become clear. First, with regard to accounting-based performance measures, the U.S. sample reflects a higher degree of positive correlations among profit-based measures than Japanese firms. Second, when market-based measures are employed to measure firm performance MVA seems to be more closely aligned with accounting-based measures for U.S. firms, while Japanese firms exhibit a closer relationship between EVA and accounting-based measures of performance. ROE was positively related with EVA and MVA for both U.S. and Japanese firms. It is interesting that the variable which is the focal point of EVA/MVA, namely, equity and the cost of capital, should be significantly related with ROE, which reflects the relationship between profits and equity. Overall, the interrelatedness of the performance measures varied depending on the country being studied, suggesting that the basis for calculating profitability measures may not be universal across countries.

Third, with the exception of ROA, all performance measures were positively correlated with the entropy measure of product-based diversification for U.S. firms, regardless of how product-diversification was measured. The "American perspective" of diversification as product-based (entropy) seems to be in effect among the firms in the sample. However, only EVA was associated with product-based diversification for Japanese firms. It would seem that the countries being studied do not exhibit the same relationships between product-based diversification and firm performance. Given the proposed "American perspective" and its wide acceptance among U.S. firms it would not be surprising to find such a relationship. However, the more recent concentric measure of product diversification was only significantly related with lower levels of ROS for Japanese firms.

**Table 1: General Statistics and Correlation Matrix (JAPAN)<sup>a</sup>**

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12
1. ROA	0.74	2.47												
2. ROE	1.98	23.63	0.12											
3. ROS	0.85	3.07	0.94**	0.23*										
4. MVA	808,089	192,364	0.18	0.02	0.19*									
5. EVA	-17,148	45,904	0.27**	0.11	0.29**	0.05								
6. Firm size	20.94	1.17	0.01	0.09	-0.04	0.31**	-0.23**							
7. Capital	1.10	0.36	0.04	-0.18	0.10	0.03	0.03	-0.37						
8. Leverage	2.69	5.79	-0.04	-0.61	-0.11	-0.13	-0.15	0.19*	-0.22					
9. R&D	3.09	2.63	0.25**	-0.02	0.31**	0.32**	0.09	-0.07	0.25**	-0.25**				
10. PD-Ent.	0.86	0.54	-0.14	-0.12	-0.15	0.01	-0.31**	0.19*	-0.04	0.19*	-0.01			

11. PD-Con.	0.18	0.08	-0.04	-0.21*	-0.06	0.15	0.09	0.01	0.17	-0.05	0.21*	0.55**		
12. MD-Ent.	0.68	0.40	0.22*	-0.01	0.22*	0.40**	0.03	0.04	0.15	-0.08	0.21*	0.01	0.01	
13. MD-Con.	0.19	0.08	0.33**	0.03	0.30**	0.13	-0.17	0.11	0.07	-0.04	0.10	0.03	-0.03	0.67**

<sup>a</sup> n = 102; \* p < .05, \*\* p < .01

Fourth, only accounting-based performance measures were significantly associated with multinational diversification for U.S. firms. U.S. firms did show any relationship between multinational diversification and performance when measured using the concentric method of calculation. Once again, the overall perspective of entropy or product based rules for determining diversification is evident for U.S. firms. Japanese firms on the other hand, reported significant relationships between accounting- and market-based measures of performance and multinational diversification, when using both entropy- and concentric-based measures of diversification. It should be noted that only MVA was correlated with multinational diversification for Japanese firms. The most universal and consistent relationship between countries was found between accounting-based performance measures and multinational diversification when measured using the entropy method of calculation.

**Table 2: General Statistics and Correlation Matrix (U.S.)<sup>a</sup>**

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12
1. ROA	6.38	6.69												
2. ROE	15.34	18.43	0.61**											
3. ROS	6.31	8.08	0.84**	0.62**										
4. MVA	20,420	34,851	0.36**	0.28**	0.35**									
5. EVA	2,873	10,567	0.11	0.10	0.21**	0.16*								
6. Firm size	16.33	0.93	0.09	0.11	0.13	0.33**	-0.02							
7. Capital	1.18	0.69	-0.21**	-0.16*	0.08	0.09	0.21**	0.06						
8. Leverage	1.75	6.10	0.01	-0.03	-0.02	-0.07	0.10	-0.09	-0.01					
9. R&D	3.30	4.23	0.31**	0.03	0.37**	0.31**	0.04	0.06	0.20**	-0.11				
10. PD-Ent.	0.85	0.53	0.07	0.21**	0.15*	0.39**	0.38**	0.08	0.10	0.04	0.01			
11. PD-Con.	0.18	0.08	-0.03	0.15*	0.03	0.14	-0.02	0.04	0.03	0.03	-0.1	0.56**		
12. MD-Ent.	0.76	0.36	0.19**	0.16*	0.16*	0.08	-0.03	-0.07	-0.11	-0.11	0.37**	0.02	-0.05	
13. MD-Con.	0.21	0.06	0.02	0.04	0.01	0.04	0.01	-0.08	-0.08	-0.09	0.26**	0.01	0.01	0.64**

<sup>a</sup> n = 175; \* p < .05, \*\* p < .01

Lastly, there was a great degree of commonality among the two perspectives for computing product- and market-based measures of diversification. Both multinational-entropy and multinational-concentric, and product-entropy and product-concentric were positively correlated with each in U.S. and Japanese samples. When the derivation of the two alternative proxies of diversification (entropy and concentric) are taken into account a lot of similarities are readily apparent. The finer distinctions between the two measures may not be reflected in the current sample.

R&D intensity was consistently identified as an important factor in explaining firm performance. In addition to R&D intensity, only firm size was significantly correlated with firm performance for Japanese firms. For U.S. firms, size was only correlated with EVA, while capital intensity was more important in explaining a firm's performance.

Results of the hierarchical regressions (Tables 3 and 4) suggest that all measures of diversification were significantly important in explaining a firm's performance, when performance was measured by

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market-based measures (EVA and MVA). Both measures of multinational diversification were positively associated with EVA and MVA across countries, supporting the contention that multinational diversification may indeed lead to improved performance. It should be noted that causality was not addressed in the study and therefore, no firm conclusions can be drawn on this point.

**Table 3: Results of Hierarchical Regression Analysis (JAPAN)<sup>a</sup>**

Variables	ROA		ROE		ROS		MVA		EVA	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Size	.018	.219	.126	.128	-.003	-.023	.381***	.371***	-.24	-.178
Capital	-.01	-.039	-.267***	-.228**	.024	.013	.084	.027	-.099	-.137
Leverage	.025	.064	-.533***	-.551***	.02	.013	-.11	-.085	-.106	-.028
R&D	.266**	.248**	.126	.082	.288**	.288**	.287**	.205**	.072	.017
PD-Ent.		-.169		.121		-.138		-.112		-.462***
PD-Con		.023		-.04		-.019		.357***		.216*
MD-Ent		-.052		-.247**		-.036		.214**		.362**
MD-Con		.36**		.203**		.289**		.231**		.242*
R <sup>2</sup>	.067	.192	.336	.375	.097	.195	.224	.353	.074	.26
Δ P <sup>2</sup>		.125		.039		.099		.129		.186
F	1.742	2.760**	25.546***	14.359***	2.593*	2.816**	6.984***	6.336***	1.946	4.090***
F of Δ R <sup>2</sup>		3.592**		2.349*		2.846*		4.639**		5.845***

<sup>a</sup>n = 102 ("listwise" deletion). Values are standardized regression coefficients; \*P < 0.05, \*\*P < 0.01, \*\*\*P < 0.001

Although product-based diversification was consistently related with market-based performance, the direction of the relationships varied across countries. First, both U.S. and Japanese market-based performance measures reflected a negative correlation with product-based diversification when measured using the entropy measure. However, U.S. firms report a negative relationship between market-based measures of performance and concentric product diversification, while Japanese firms report a positive relationship. It can be concluded that product-based diversification has an overall negative influence on firm performance when measured as EVA and MVA and that this applies across countries.

Results using accounting-based measures of firm performance yield conflicting and inconsistent findings between countries. ROS was positively correlated with concentric multinational diversification for both Japanese and U.S. firms, while ROA was positively associated with concentric multinational diversification for Japanese firms, but negatively related in the U.S. sample. However, ROE was positively related to entropy- and concentric-base measures of product diversification for U.S. firms, but the Japanese sample reports a negative relationship with entropy-based multinational diversification and a positive association with concentric-based multinational diversification. Based on these findings the exact relationship among accounting-based measures of performance and diversification cannot be clearly ascertained.

Table 4: Results of Hierarchical Regression Analysis (U.S.)<sup>a</sup>

Variables	ROA		ROE		ROS		MVA		EVA	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Size	.090	.080	.118	.109	.108	.094	.308***	.377***	-.020	-.050
Capital	-.286**	-.039	-.181*	-.178*	.006	.008	.020	.023	.208**	.152**
Leverage	.053	.48	-.018	-.019	.028	.21	-.005	-.026	.016	.109
R&D	.370**	.349**	.051	.016	.258**	.340**	.278**	.284**	.106	.083
PD-Ent.		.131		.186*		.149		-.419***		-.467***
PD-Con		.176		.231*		.171		-.207*		-.195*
MD-Ent		-.067		.058		-.026		.184*		.345***
MD-Con		-.189*		-.125		.280**		.242**		.190*
R <sup>2</sup>	.186	.223	.045	.125	.144	.186	.187	.327	.055	.270
Δ P <sup>2</sup>		.037		.080		.042		.139		.215
F	9.548	5.839***	1.960	2.914**	2.593*	2.816**	9.612***	9.882***	2.437	7.539***
F of Δ R <sup>2</sup>		1.919		3.739**		2.100		8.439***		11.998***

<sup>a</sup>n = 172 ("listwise" deletion). Values are standardized regression coefficients; \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001

The overall results do suggest that international differences do exist when it comes to diversification and the various methods of operationalization. In general, market-based measures of performance are more strongly and consistently associated with various measures of diversification. Evidence clearly points to the strength of utilizing the market-based measures of EVA and MVA in conducting research studies on the subject of diversification. The preponderance of the results supported the contention that multinational or market-based diversification tends to outperform product-based diversification, especially when it comes to U. S. firms. However, Japanese firms are able to derive positive benefits from product-diversification when operationalized by the concentric index. Such differences between countries highlight the notion that international differences do, in fact exist when engaging in diversification. Understanding the rationale for these differences may serve as a key to unlocking the mystery of international diversification.

Of the covariates used in the models firm size was helpful in explaining firm MVA across countries, although it was not significant in any other model. This supports the contention that larger firms are more profitable and create more value, as defined by MVA, than smaller firms. R&D on the other hand, was found to exert a positive effect on performance when measured as ROA, ROS, and MVA for U.S. and Japan. Capital intensity seemed to play a greater role in U.S. firms than in the Japanese sample, while debt leverage was on negatively related in the Japanese sample for ROE.

In general, the research findings suggest that market-based measures of firm performance, EVA and MVA, may more accurately reflect the benefits and liabilities of diversification strategies than traditional accounting-based measures. The use of EVA and MVA measures of firm performance were more consistent in the present study than the more traditional accounting-based measures. Accounting-based measures did not show any consistency across the various diversification measures or countries used in the present study. The evidence suggests that accounting-based measures of performance may not be the most comprehensive method for evaluating the effects of diversification on firm performance. Some of the differences observed in the results can be explained by two things: different measures of performance and different measures of diversification. In addition, the assumption of generalizability of diversification indexes across countries can be risky at best and downright dangerous when it comes to comparability with previous studies. The contention that the strategy of diversification is universal across countries has not been supported.

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