The Combined Effect of International Diversification and Product Diversification Strategies on the Performance of U.S.-Based Multinational Corporations

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Rakesh B. Sambharya

The Combined Effect of International Diversification and Product Diversification Strategies on the Performance of U.S.-Based Multinational Corporations

Abstract

- Multinational corporations (MNCs) pursue the dual strategies of product diversification and international diversification and attempt to achieve a combination which results in optimal worldwide performance.
- Hypotheses were generated and tested by analyzing data on 53 U.S. MNCs. Multiple measures of both product and international diversification were used.

Key Results

- An inverse relationship exist between product diversification and international diversification. Both international and product diversification individually have no effect on firm performance but their interaction leads to a substantial increase in firm performance.

Author

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Rakesh B. Sambharya

Introduction

The topic of diversification has become a dominant stream of research in the strategic management literature. Spurred by Rumelt’s (1974) seminal work on corporate diversification a debate has raged on as to whether related diversified firms perform better than unrelated diversified ones. On the other hand, scholars in international business have wrestled with questions of domestic versus international diversification and the strategy-structure fit moderated by the degree of international involvement (Daniels, Pitts and Tretter 1985). These two streams of research have progressed relatively in isolation except in a few cases. A few studies recently have attempted to combine the product and market dimensions of global operations and their relationship to corporate performance (Buhner 1987, Geringer, Beamish, and da Costa 1989, Kim, Hawang, and Burgers 1989).

The present study examines the industry adjusted performance of U.S. multinational corporations (MNCs) as it relates to several measures of product diversification and international (market) diversification. The paper is organized as follows. The first section is a review of the literature on product diversification and international diversification. In the second section some hypotheses are proposed. Third, the methodology is explained. Finally, a discussion of the results and findings is presented.

Literature Review

Product Diversification

In his benchmark study, Rumelt (1974) defined diversification as an “entry into a new product market activity that requires or implies an appreciable increase in the available managerial competence within the firm” (p. 10). Reaching out into new areas requires the development of new competencies or the augmentation of existing ones. Studies by Bettis (1981), Rumelt (1982), Palepu (1985), Suzuki (1980), and Varadarajan and Ramanujam (1987) have supported Rumelt’s (1974) findings that related diversifiers outperform unrelated diversifiers. However, other studies report no differences (Grant and Jammine 1988, Melicher and Rush 1973) or the opposite (Luffman and Reed 1984, Michel and Shaked 1984). One of the reasons for the mixed findings of the product diversification research may be that the international diversification component has been neglected or ignored by strategy scholars (Hitt, Hoskisson, and Ireland).
1994). Detailed literature reviews on product diversification have been recently published (Hoskisson and Hitt 1990, Ramanujam and Varadarajan 1989) and hence will not be repeated here.

**International Diversification**

Several researchers have reported that firms that diversify internationally perform better than those which do not. Bergsten, Horst, and Moran (1978) found that firms which had more foreign direct investment had higher profits during 1965–1971. Leftwich (1974) found that MNCs perform better than domestic firms in terms of profits. Miller and Pras (1980) studied 246 major U.S. corporations for the years 1961, 1965, and 1968 and found international diversification to be significantly related to corporate profit stability compared to product diversification and exporting. Buhner (1987) showed international diversification was significantly and positively associated with performance in 40 large West German firms. In a sample of 304 British MNCs, Grant (1987) demonstrated that profitability was strongly associated with international diversity.

**Product and International Diversification**

A number of empirical studies have examined both product and international dimensions of strategy (see Table 1). In his study of 95 U.S. industries, Wolf (1977) found that the manufacturing firms most likely to operate on a multinational and multi-industry basis are large and have strong technical capabilities. In analyzing time series production index data of three industries in four major industrial countries, Madura and Rose (1987) found that manufacturing firms could reduce their risk exposure by diversifying internationally in their specialized field. However both studies looked only at industry level data and not at firm level data.

Several studies have investigated both product and international diversification using firm-level data (Buhner 1987, Geringer, Beamish, and da Costa 1989, Kim, Hwang, and Burgers 1989, Miller and Pras 1980). However these studies suffer from a number of shortcomings. Kim et al. (1989) studied 62 U.S. MNCs and found that the performance of related and unrelated product diversification strategies depends upon the degree of international involvement. Hence, unrelated diversifiers with high market diversification are better than average performers. They used global market diversification as their international diversification measure which takes into account only the dispersion of international sales by six market groups and ignores the total amount of international involvement. Moreover, their model implies that there exists no direct relationship
between product and international diversification since the later was used as a moderator. However, other studies have reported a significant relationship between product and international diversification (Grant, Jammie, and Thomas 1988, Madura and Rose 1987).

Finally, Geringer et al. (1989) showed that dominant constrained or related constrained MNCs performed significantly better than European MNCs. They found that the degree of internationalization showed a significant and curvilinear relationship to performance only after correcting for continent-of-origin. A problem with this study is that they did not use actual performance numbers. Instead, firms with dominant-constrained and related constrained strategies were considered high performers based on the results of Rumelt’s original study. Similarly, single businesses, related-linked, and conglomerates were considered as medium performers whereas unrelated-passive and dominant-vertical firms were designated as poor performers. However, Rumelt’s classification scheme has failed to demonstrate robustness across time and samples (Dubofsky and Varadarajan 1987, Grant et al. 1988, Michel and Shaked 1984). In fact, in an exhaustive review of the product diversification literature, Hoskisson and Hitt (1990) concluded that there was no significant relationship between diversification and performance. Therefore, the Geringer et al. (1989) results should be interpreted with caution. Previous research on the combined effects of product

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Rakesh B. Sambharya

**Table 1. Summary of Previous Studies Combining International Diversification and Product Diversification Strategies**

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample and Time Frame (T)</th>
<th>International Diversification (ID) Measure</th>
<th>Product Diversification (PD) Measure</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wolf (1977)</td>
<td>95 U.S. Mfg. Industries T=1960</td>
<td>% (Exports + Foreign Sales of U.S. Affiliates)/ Domestic Production</td>
<td>% of employees in the non i-th industry</td>
<td>Firm size and technical know-how lead to PD and ID</td>
</tr>
<tr>
<td>Buhner (1987)</td>
<td>40 W. German MNCs T=1966–1981</td>
<td>% Foreign Sales</td>
<td>Rumelt’s classification Herfindahl’s index</td>
<td>ID was positively related to performance whereas PD was negatively related</td>
</tr>
<tr>
<td>Geringer, Beamish and da Costa (1989)</td>
<td>100 U.S. 100 and European MNCs T=1977–1981</td>
<td>% Foreign Sales</td>
<td>Rumelt’s classification</td>
<td>Both ID and PD had a curvilinear relationship to performance</td>
</tr>
<tr>
<td>Grant, Jammie, and Thomas (1988)</td>
<td>304 British Mfg. MNCs T=1972–1984</td>
<td>% Foreign Sales</td>
<td>Modified Rumelt’s classification</td>
<td>ID was positively related to performance but PD had a curvilinear relationship</td>
</tr>
</tbody>
</table>

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200  

*mlr* vol. 35, 1995/3
and international diversification on firm performance has three major shortcomings. First, as pointed out earlier all the studies used only one measure of international diversification. There is no agreement among scholars in the international business area on how to measure international diversification which is a multi-dimensional construct. Hence, using only one measure is risky. Scholars have advocated the use of multiple measures to offset any possibility of spurious results (Hoskisson and Hitt 1990, Ramanujam and Varadarajan 1989). Second, none of the studies looked at the interaction between international and product diversification. Hitt, Hoskisson, and Ireland (1994) made a strong conceptual argument for investigating the interaction between these types of diversification. Third, no one study used industry adjusted financial performance. Thus, the results obtained obscure the industry and measurement effects and should be viewed with caution. Dess, Ireland, and Hitt (1990) stressed the importance of utilizing industry adjusted performance in the field of strategic management. Researchers studying product diversification (Hoskisson and Hitt 1990) and international diversification (Vachani 1991) have made a strong plea to incorporate both dimensions in future studies of global diversification.

Vachani (1991) proposed a comprehensive measure of global diversification which incorporates related and unrelated aspects of international diversification analogous to that used in the product diversification literature. This measure would consist of unrelated product diversification, unrelated international geographical diversification, related international geographic diversification, and related product diversification. Conceptually, this global measure is an improvement over existing measures such as geographic market dispersion (Miller and Pras 1980). However, the paucity of related and unrelated international sales data limits the applicability of this measure at present. If and when such data becomes available, Vachani’s measure should become the optimal one for future studies on product and international diversification.

The present study examines the individual and joint effects of product and international diversification on firm performance. Our intent is to build on upon the previous literature by overcoming the methodological problems of the earlier studies. The present study includes multiple measures of both international and product diversification and corrects for industry performance. More importantly, it examines the interaction between product diversification and international diversification which has been identified as an important area for future research but has not yet been studied. The relationship between product and international diversification is a complex one that is expected to exert a considerable influence on firm performance. MNCs in particular are constantly struggling to balance their total diversification endeavors in order to optimize their overall performance.
Hypotheses

Several barriers prevent investors from conveniently achieving international diversification through direct investments in foreign financial instruments. These barriers exist in the form of host country regulations regarding foreign direct investment, transaction costs, access to information, foreign exchange risk, and a lack of fully functioning capital markets. MNCs possess unique advantages that can overcome these barriers and are considered superior vehicles for achieving international diversification. MNCs take advantage of imperfections in product and real factor markets, superior technology and market power (brand names), and achieve economies of scale and scope. Theoretically, MNCs are considered superior investment vehicles for achieving international diversification. Empirically, this thesis has been generally supported (Aggarwal 1979, Agmon and Lessard 1977, Errunza and Senbet 1984, Solnik 1974).

Several studies have shown that international diversification leads to superior performance (Daniels and Bracker 1989, Kim, Hwang and Burgers 1993, Rugman 1979). A variety of reasons have been given for the success of international diversification. Caves (1982) stated that international diversification leads to stability of returns. Kogut (1985) argued that international diversification leads to firms taking advantage of economies of scale, scope, and experience. Kobrin (1991) demonstrated that multinational firms that effectively integrate globally in terms of rational production, standardizing products, and coordinating R&D would be in a position to amortize investments over a broader base. MNCs are able to exploit their core competencies through international diversification (Hamel 1991).

Hypothesis 1

MNCs which are highly diversified internationally will perform better than those which are less diversified internationally.

Do firms prefer product diversification over international diversification or vice versa? Several studies have indicated that firms prefer international diversification over product diversification. In a study of four industries in four countries over a 30 year period, Madura and Rose (1987) reported that reverse product diversification occurred in favor of international diversification. In a recent study, Grant et al. (1988) reported that in 262 British manufacturing firms, multinational diversity was negatively strongly associated with product diversity. Lastly, the work of Buhner (1987) also hinted at an inverse relationship between product and international diversification as the former was negatively associated with market and accounting measures of performance whereas the latter was positively associated with the same.
Both strategies require different types of skills and are risky. In both strategies, firms spread themselves out in terms of product proliferation or market proliferation. It is unlikely that firms would take both risks simultaneously. The firm's decision regarding its diversification preference would depend on the philosophy of top management, nature of industry, and opportunities available. Firms that are more diversified in terms of products are likely to take advantage of financial synergies as opposed to market or technological synergies. Their business units will have less in common in international markets. There will be very few firms that are willing to take product diversification (financial) risks as well as international (market) risks. Thus, MNCs that are diversified internationally are likely to be less diversified in terms of products. Moreover, international diversification can lead to stabilization of returns (Caves 1982) whereas product diversification has been shown to be neutral, at best, in its relationship to performance (Hoskisson and Hitt 1990).

Hypothesis 2

Product diversification will be inversely related to international diversification in MNCs.

The literature suggests that the interaction between international and product diversification influences firm performance. Hitt et al. (1994) state that the relationship between international diversification and performance is affected by the degree of product diversification. Many MNCs operate with disparate products and in multiple markets simultaneously. In order to succeed in their global or multidomestic strategies, they need to achieve synergies and exploit interdependencies among product groups across their far-flung markets (Hout, Porter, and Rudden 1982). Even though we hypothesize an inverse relationship between product and international diversification, a firm can exploit globally economies of scale and scope, resource sharing, and core competencies across business units.

Kim et al. (1989) found that international diversification moderated the relationship between product diversification and firm performance. In related diversified firms, these actions are quite obvious. However, even for unrelated firms international markets may offer a chance to achieve more than just financial synergies. MNCs that are able to find a judicious and optimum combination of both types of diversification will be successful. Firms which are able to transfer skills across markets and products and gain from organizational learning will be able to exploit synergies and achieve better performance. Parkhe (1991) stated that the simultaneous consideration of product and international diversification is essential for firms to achieve the optimal allocation of resources.
Hypothesis 3

The interaction between international and product diversification influences performance in MNCs.

The four most common modes of foreign market entry are exporting, licensing, wholly owned subsidiary, and joint venture. The choice of mode of entry made by a particular firm would depend on the resources available, propensity to bear risk, the importance of control in the organization, and its international strategy (Agarwal and Ramaswami 1992, Hill, Hwang, and Kim 1990). Numerous studies have examined foreign market entry in the context of national culture (Kogut and Singh 1988), the extent of foreign direct investment (Dunning 1980, Terpstra and Yu 1988), and in terms of global strategies, environment, and transaction costs (Kim and Hwang 1992). Wind and Douglas (1981) proposed an international diversification portfolio based on a combined stochastic dominance and analytical hierarchical approach. This model calls for including scenarios, goals, objectives, countries, mode of entry, market segments, and products in any international diversification endeavor. However, the empirical link between international mode of entry and product diversification has been sparse to the best of our knowledge.

Two studies have examined the relationship between international diversification and product diversification in terms of Rumelt's categories (Buhner 1987, Geringer et al. 1989). Buhner reported that firms with a single business strategy were the most diversified internationally. Single business firms use their experience to expand into many markets and achieve economies of scale. Organizational learning can be used to counter cultural barriers. Related business firms, on the other hand, that diversify internationally can exploit interdependencies across business units through economies of scale and scope, resource sharing, and core competencies. International diversification reduces risks in related diversified firms by stabilizing returns (Hitt et al. 1994). Thus, differences in factor markets and in demand and supply across international markets can aid related diversified firms increase stability of their returns. On the other hand, as firms become more diversified in terms of unrelated products their international presence decreases due to the lack of interdependencies across business units. MNCs will try to find some synergies which optimize their product and international diversification activities.

Firms with a related business strategy are likely to have a global strategy and thus expand internationally by establishing wholly owned subsidiaries to ensure tight integration and coordination. On the other hand, MNCs with an unrelated product strategy are likely to favor joint ventures (Harrigan 1988). In an empirical study of 200 large U.S. firms from the Harvard Multinational Enterprise Project database, Gomes-Casseres (1989) found that when firms sought to expand into a new field a joint venture was the most appropriate strategy.
International Diversification and Product Diversification Strategies

Hypothesis 4a

MNCs with a single business strategy will have the highest international involvement, dominant businesses the next highest, related businesses less, and unrelated businesses the least involvement.

Hypothesis 4b

MNCs relying on a related product strategy will have more foreign subsidiaries than those relying on an unrelated product strategy.

Hypothesis 4c

MNCs using a related product strategy will have fewer joint ventures than those using an unrelated product strategy.

Research Methodology

This section describes the data collection, research design, and measurement of the variables included in the present study.

Sample

Corporations had to meet two criteria commonly used in international business to be included in this study. First, ten per cent of their foreign sales had to be from abroad (Daniels, Pitts, and Tretter 1985). Second, the MNCs had to have operations abroad in at least six countries (Vaupel and Curhan 1973). Starting with the 1985 Fortune Industrial 500 list, 280 firms met the above criteria for inclusion in the study.

A questionnaire measuring foreign sales and number of foreign subsidiaries was mailed to a key informant in each firm. The questionnaire was mailed to the Executive Vice President for International Operations in each firm. This individual was identified in Standard and Poor's Register of Corporations, Directors, and Executives (1985). When this individual could not be identified the questionnaire was addressed to the CEO or President. The response rate was 19.8% resulting in a sample of 53 firms from two mailings. Respondents and non-

mir vol. 35, 1995/3

205
respondents did not differ when compared in terms of size measures as sales ($t = 0.88$, $df = 265$, $p > 0.05$) and profitability measured as return on sales ($t = 0.95$, $df = 263$, $p > 0.05$) and return on assets ($t = 1.02$, $df = 259$, $p > 0.05$). In addition, we found no differences between respondent firms from the first and second mailings. Thus, we concluded that non-respondent bias is not a concern in this study and that the results generalizable to large U.S. manufacturing MNCs.

Data Collection

Data on foreign sales was collected through a cross-sectional mail survey. The present study was part of a larger research project. Data for all the other international diversification, product diversification, and performance variables was collected through archival sources such as Compustat on CD-ROM, Worldscope and Directory of Multinationals.

Measurement of Variables

We used multiple measures of both product and international diversification in our study for three reasons. First, since both measures are multidimensional the probability of Type I or Type II errors increases in hypotheses testing with the use of single measures (Baggozzi, Youjae, and Phillips 1991). Second, single item measurement is associated with creating a methods bias and may lead to questionable reliability and spurious results (Nunnally 1978). Third, previous empirical studies on international and product diversification have relied on one measure of international or product diversification raising the possibility of spurious results. The formulae and computations used to measure the various diversification variables are shown in Appendix 1.

Rumelt’s Classification

The Wrigley’s/Rumelt scheme of diversification is comprised of single business, dominant business, related business, and unrelated business. The novelty of Rumelt’s approach was that he conceptualized a discrete business unit as firm specific and followed a firm’s history and behavior to determine the firm’s utilization of strengths, core skills, and purposes to achieve its diversification objectives. Thus, sample firms were classified into Rumelt’s categories by calculating the specialization, related, and vertical ratios respectively with help from annual reports and other archival information.
International Diversification and Product Diversification Strategies

Entropy Measure

Jacquemin and Berry (1979) proposed an “entropy” measure of diversification which retains the simplicity of the SIC count approach and captures the richness of Rumelt’s classification scheme. Firm participation in different two digit SIC codes is treated as unrelated diversification. However, any entry or participation by a firm into a four digit SIC code within the parent two digit SIC code is regarded as related diversification. Therefore, two indices can be computed, one for related diversification and another for unrelated diversification. Upon adding these indices the sum is the firm’s total diversification. For a detailed technical explanation and description of the entropy measure the reader is referred to Palepu (1985).

Broad and Narrow Spectrum Diversity

A simple measure of diversification was offered based on SIC count (Varadarajan and Ramanujam 1987). This new measure is based on the work of Wood (1971) and is conceptualized in terms of two dimensions: broad spectrum diversity (BSD) and mean narrow spectrum diversity (MNSD). BSD is defined as the number of 2 digit SIC codes in which a firm operates. MNSD is defined as the number of four digit SIC codes in which a firm operates divided by the number of two digit SIC categories in which the firm operates (Varadarajan and Ramanujam 1987). Hence a firm can be considered a low diversifier if it is low on BSD and MNSD and a higher diversifier if it is high on both of these dimensions. Conceptually BSD and MNSD are similar to the related and unrelated components of the entropy measure. However, in terms of measurement it avoids the use of detailed business segment sales data and the computations involved in the entropy measure.

Foreign Sales

One of the most common measures of international diversification is the ratio of foreign sales to total sales. Numerous studies have used this ratio as a surrogate for international strategy (Buhner 1987, Geringer et al. 1989). In an empirical study, Daniels and Bracker (1989) demonstrated that the amount of foreign operations (particularly in some industries) affects the firm’s overall profitability. The present study measured the size of foreign operations in two ways. First, a ratio of foreign sales to total sales was computed (FORSALES). Second, a ratio of foreign assets to total assets was also calculated (FORASSETS). FORASSETS is also a measure of foreign production dependence.
Rakesh B. Sambharya

(Daniels and Bracker 1989). The log of FORSALES and FORASSETS was taken to normalize the distribution of these variables. Hence, these variables were denoted as LFORSALES and LFORASSETS.

Number of Foreign Subsidiaries

This is a simple measure which includes the number of non-U.S. subsidiaries a firm has abroad. Errunza and Senbet (1984) state that this measure captures a different but important aspect of international diversification. Data were collected from Standard and Poor's and from the Directory of Multinationals. A log was taken of this variable and called LNSUBS.

Market Heterogeneity

Miller and Pras (1980) developed an entropy measure of international diversification based on a firm's presence in six global homogeneous market groups. Kim et al. (1989) used a similar methodology in their study. GMD is an improvement over simply counting the number of subsidiaries and is an index of market heterogeneity.

Performance

Traditional accounting measures such as return on sales (ROS), return on assets (ROA), and return on equity (ROE), were used in this study to measure firm performance and adjusted for industry averages. A mean of three years (1985, 1986, and 1987) was taken to smooth out temporal fluctuations. Two measures of foreign performance, namely foreign return on sales (FROS) and foreign return on assets (FROA), were used to evaluate international operations. The mean of two years (1985 and 1986) was taken to account for temporal influences.

Results and Discussion

Summary statistics for all variables are reported in Table 2. T-tests were employed to test for differences in performance between highly and less internationally diversified MNCs and are reported in Table 3. Median values of the
International Diversification and Product Diversification Strategies

Table 2. Means, Standard Deviations, Correlations of All Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFORSALES</td>
<td>-1.47</td>
<td>0.61</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GMD</td>
<td>1.02</td>
<td>0.43</td>
<td>0.50***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LFORASSETS</td>
<td>-1.49</td>
<td>0.55</td>
<td>0.83***</td>
<td>0.42***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNSUBS</td>
<td>2.56</td>
<td>1.14</td>
<td>0.52***</td>
<td>0.44***</td>
<td>0.56***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENTROPY</td>
<td>1.37</td>
<td>0.42</td>
<td>-0.5***</td>
<td>-0.31***</td>
<td>-0.32***</td>
<td>-0.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZE</td>
<td>8.24</td>
<td>1.42</td>
<td>0.23</td>
<td>0.04</td>
<td>0.10</td>
<td>-0.02</td>
<td>0.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>0.47</td>
<td>3.52</td>
<td>0.03</td>
<td>-0.10</td>
<td>-0.12</td>
<td>-0.18</td>
<td>0.05</td>
<td>0.41***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>-0.06</td>
<td>2.85</td>
<td>-0.02</td>
<td>-0.15</td>
<td>-0.07</td>
<td>-0.16</td>
<td>0.03</td>
<td>0.22*</td>
<td>0.83***</td>
<td></td>
</tr>
<tr>
<td>LFORASSETS</td>
<td>1.79</td>
<td>6.16</td>
<td>-0.10</td>
<td>-0.22*</td>
<td>-0.15</td>
<td>-0.11</td>
<td>0.15</td>
<td>0.27**</td>
<td>0.64***</td>
<td>0.81***</td>
</tr>
</tbody>
</table>

Note: * = p ≤ 0.10; ** = p ≤ 0.05; *** = p ≤ 0.01.

Table 3. Results of T-Tests Comparing Low and High Levels of Internationalization

<table>
<thead>
<tr>
<th>Variables</th>
<th>LFORSALES</th>
<th>LFORASSETS</th>
<th>LNSUBS</th>
<th>GMD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROS</td>
<td>0.26</td>
<td>0.07</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>-0.07</td>
<td>-0.17</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>2.17</td>
<td>1.15</td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td>FROS</td>
<td>0.01</td>
<td>0.11</td>
<td>-0.48</td>
<td></td>
</tr>
<tr>
<td>FROA</td>
<td>0.09</td>
<td>0.14</td>
<td>-2.84**</td>
<td></td>
</tr>
</tbody>
</table>

Note: * = p ≤ 0.10; ** = p ≤ 0.05.

four international diversification measures were used. Results indicate that MNCs with higher international diversification are not significantly different than those with less international diversification on the LFORSALES and LFORASSETS measures. In fact, on the LNSUBS measure low international diversifiers were marginally and significant better performers than high international diversifiers. These results are opposite of what Buhner (1987) and Daniels and Bracker (1989) found. Thus, there is no support for hypothesis 1.

Table 4 shows Pearson correlation coefficients between product diversification measures (BSD, MNSD, ENTROPY-total, ENTROPY-unrelated and ENTROPY-related) with international diversification measures (LFORASSETS, LFORSALES, LNSUBS, and GMD). Among all the international diversification variables GMD had the strongest negative relationship with the three out of the five product diversification variables (ENTROPY-total, ENTROPY-unrelated, and BSD). Both LFORSALES and LFORASSETS were also negatively and significantly correlated to ENTROPY-total and ENTROPY-related and had the predicted negative sign with the other three product diversification variables. LNSUBS, on the other hand, was the least correlated with the product diversification measures and was marginally and positively related to
MNSD. Overall, MNCs that were highly diversified on product bases are likely to be the least diversified in international markets. Therefore, hypothesis 2 is supported. MNCs do indeed have a preferred mode of diversification either in terms of markets or products. Further research is needed on why firms prefer one strategy to another.

Table 5 shows the results of regressing firm performance on the four international diversification measures and product diversification (ENTROPY) after controlling for size. Four separate regressions were run, one for each international diversification measure along with its interaction with ENTROPY. The first panel shows the results for the independent variable LFORSALES and for all three dependent variables (ROS, ROA, and ROE). Only the ROS equation was marginally significant and both product and international diversification strategies were insignificant. However, when the interactions are taken into account all three equations become highly significant with a substantial improvement in the variance accounted for. Thus, we see that the R² improves from 0.17 to 0.31 for ROS, from 0.05 to 0.27 for ROA, and from 0.11 to 0.30 for ROE respectively. Due to the effects of multicollinearity it is difficult to interpret the coefficients of the interaction terms in moderated regression analysis. Thus, we see that the interaction between both types of diversification explains much more variance in firm performance.

Similar results are obtained for the independent variable LFORASSETS shown in panel B. However, when international diversification is measured by LNSUBS the regressions are insignificant as shown in panel C even after interactions are added. Results for GMD shown in panel D are strong only for the ROE equation after the interactions are added. In sum, different measures for the international diversification variable show different results. Thus, we see that the individual strategies by themselves have no effect on firm performance but that their interaction exerts a tremendous influence on firm performance. None of international and product diversification measures by themselves had
International Diversification and Product Diversification Strategies

Table 5. Results of Regressing Performance on International and Product Diversification

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>ROS</th>
<th>ROA</th>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Panel A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LFORSALES</td>
<td>-0.05</td>
<td>1.47**</td>
<td>-0.06</td>
</tr>
<tr>
<td>ENTROPY</td>
<td>0.04</td>
<td>-0.88**</td>
<td>0.02</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.42***</td>
<td>0.35**</td>
<td>0.23</td>
</tr>
<tr>
<td>LFORSALES × ENTROPY</td>
<td></td>
<td>-2.03**</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.17</td>
<td>0.31</td>
<td>0.05</td>
</tr>
<tr>
<td>F-Ratio</td>
<td>2.6</td>
<td>4.06</td>
<td>0.70</td>
</tr>
<tr>
<td>Significance</td>
<td>0.07</td>
<td>0.008</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>Panel B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LFORASSETS</td>
<td>-0.16</td>
<td>1.26**</td>
<td>0.10</td>
</tr>
<tr>
<td>ENTROPY</td>
<td>0.003</td>
<td>-0.94**</td>
<td>0.10</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.43***</td>
<td>0.30</td>
<td>0.23</td>
</tr>
<tr>
<td>LFORASSETS × ENTROPY</td>
<td></td>
<td>-1.96**</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.20</td>
<td>0.31</td>
<td>0.06</td>
</tr>
<tr>
<td>F-Ratio</td>
<td>3.01</td>
<td>4.03</td>
<td>0.78</td>
</tr>
<tr>
<td>Significance</td>
<td>0.04</td>
<td>0.003</td>
<td>0.51</td>
</tr>
<tr>
<td></td>
<td>Panel C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNSUBS</td>
<td>-0.18</td>
<td>-0.78</td>
<td>-0.16</td>
</tr>
<tr>
<td>ENTROPY</td>
<td>0.03</td>
<td>-0.40</td>
<td>0.01</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.42</td>
<td>0.47**</td>
<td>0.22</td>
</tr>
<tr>
<td>LNSUBS × ENTROPY</td>
<td>0.70</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.21</td>
<td>0.22</td>
<td>0.08</td>
</tr>
<tr>
<td>F-Ratio</td>
<td>3.37</td>
<td>2.67</td>
<td>1.05</td>
</tr>
<tr>
<td>Significance</td>
<td>0.03</td>
<td>0.05</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>Panel D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GMD</td>
<td>-0.10</td>
<td>-0.30</td>
<td>-0.16</td>
</tr>
<tr>
<td>ENTROPY</td>
<td>0.02</td>
<td>-1.4</td>
<td>-0.01</td>
</tr>
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<td>SIZE</td>
<td>0.42**</td>
<td>0.42**</td>
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</tr>
<tr>
<td>GMD × ENTROPY</td>
<td>0.21</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.18</td>
<td>0.18</td>
<td>0.17</td>
</tr>
<tr>
<td>F-Ratio</td>
<td>2.96</td>
<td>1.80</td>
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</tr>
<tr>
<td>Significance</td>
<td>0.08</td>
<td>0.15</td>
<td>0.46</td>
</tr>
</tbody>
</table>

Note: * = p ≤ 0.10; ** = p ≤ 0.05; *** = p ≤ 0.01.

any bearing on firm contrary to the existing literature. The most popular measures of international diversification (LFORSALES and LFORASSETS) and their interactions with ENTROPY indicate very strong support for hypothesis 3.

The link between international involvement with product diversification was also investigated using Rumelt’s categories. Table 6 shows all international diversification measures for each of the four Rumelt categories. Overall significance for differences was found only for LFORASSETS, albeit marginally. For
Table 6. Results of One-Way ANOVA Comparing Internalization Measures Across Rumelt’s Diversification Classification

<table>
<thead>
<tr>
<th>Rumelt Classification</th>
<th>International Diversification</th>
<th>LFORSALES</th>
<th>LFORASSETS</th>
<th>GMD</th>
<th>LNSUBS</th>
<th>Joint ventures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Business</td>
<td></td>
<td>-0.95</td>
<td>-0.89</td>
<td>3.15</td>
<td>3.04</td>
<td>0.33</td>
</tr>
<tr>
<td>Dominant Business</td>
<td></td>
<td>-1.5</td>
<td>-1.58</td>
<td>1.03</td>
<td>2.07</td>
<td>4.0</td>
</tr>
<tr>
<td>Related Business</td>
<td></td>
<td>-1.33</td>
<td>-1.40</td>
<td>0.99</td>
<td>2.81</td>
<td>1.72</td>
</tr>
<tr>
<td>Unrelated Business</td>
<td></td>
<td>-1.78</td>
<td>-1.71</td>
<td>0.99</td>
<td>2.46</td>
<td>5.9</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>-1.47</td>
<td>-1.49</td>
<td>1.02</td>
<td>2.56</td>
<td>3.27</td>
</tr>
<tr>
<td>F-Ratio</td>
<td></td>
<td>2.14</td>
<td>2.30</td>
<td>1.015</td>
<td>1.20</td>
<td>1.19</td>
</tr>
<tr>
<td>Significance</td>
<td></td>
<td>0.11</td>
<td>0.09</td>
<td>0.94</td>
<td>0.32</td>
<td>0.14</td>
</tr>
</tbody>
</table>

LFORSALES and GMD the differences were not significant even though they were in the predicted direction. MNCs that are single businesses have the highest foreign involvement and unrelated businesses the least. Therefore, there was only mild support for hypothesis 4a. These results are consistent with the Buhner (1987) findings on West German MNCs.

The last two columns of Table 6 show the number of subsidiaries and joint ventures by Rumelt’s diversification classification. Related businesses have higher numbers of subsidiaries than unrelated businesses but the findings were not statistically significant. Therefore, hypothesis 4b is rejected. Unrelated businesses had a higher number of joint ventures than related businesses obtained from a statistically significant t-test. Therefore, hypothesis 4c was supported. MNCs in unrelated businesses are prone to establishing joint ventures probably due to their lack of international experience and do not mind sharing control. However, MNCs in related businesses prefer wholly owned subsidiaries suggesting confidence in their ability to handle international operations and want total control over their subsidiaries.

Conclusions

Some of the findings of the present study are contrary to those of previous studies and highlight some new linkages between types of diversification strategies and performance. There are three major findings from this study of U.S. MNCs. First, MNCs which were more internationally diversified according to four different measures were no more successful than less diversified ones. This is in contrast to previous findings that suggest that more international diversi-
Diversification leads to superior performance (Geringer et al. 1989, Grant 1987, Grant et al. 1988, Miller and Pras 1980).

Second, in large organizations such as MNCs there exists an inverse relationship between product and international diversification. This result confirms previous findings of Grant et al. (1988). The choice of type of diversification between market or product depends upon the type of industry, market opportunities available, and philosophy of top management. Even the best firms in the world would find it difficult to manage both types of diversification. The skills required for each type of diversification are different, unique, and non-transferable. Thus we found that MNCs in single businesses are the most diversified internationally and vice-versa in case of MNCs in unrelated businesses confirming Buhner’s (1987) results. Also, MNCs in related businesses prefer wholly owned subsidiaries while those in unrelated businesses choose joint ventures.

Third, both international and product diversification strategies are not profitable by themselves. This is the most important finding in our study. Previous research had shown that firms perform better with international diversification than with product diversification (Buhner 1987, Grant et al. 1988, Miller and Pras 1980). We found that neither type of diversification leads to better firm performance. In an exhaustive review of the product diversification literature, Hoskisson and Hitt (1990) concluded that its relationship to firm performance was ambiguous or not clear. In addition, we found that the interaction effects of product and international diversification lead to a substantial increase in firm performance. Some of the other studies have not investigated this relationship.

Why are our findings different from previous work? There are two important and significant reasons. First, we used industry adjusted firm performance which none of the other studies investigating the combined affects of international and product diversification did. Second, our results are robust across four different measures of international diversification whereas previous studies had generally used only one indicator.

The present study makes a significant contribution to the literature on MNC corporate diversification strategies. We used multiple measures of both product and international diversification and industry adjusted firm performance. Empirical testing of hypotheses leads to the refinement of existing theories and the development of new ones. More research on different samples from a variety of developed and developing countries is needed. The relationship between diversification and performance is complex and the existence and confirmation of antecedents, moderating, and mediating variables should be the focus for future research.

The present study has two limitations. First, the results are valid only for the accounting measures of performance. Future work using market measures of performance should provide more insight. Another limitation of the study is that we did not use Vachani’s (1991) comprehensive measure of global diversi-
Rakesh B. Sambharya

Classification for practical reasons. Vachani’s measure requires detailed product information in terms of relatedness and unrelatedness data at the individual country level. When such data becomes available Vachani’s comprehensive global measure can be incorporated in future studies of international and product diversification.

Notes

1 An earlier version of this paper was presented at the Annual Meeting of the Academy of International Business at Toronto in October 1990. The authors wish to thank Briance Mascarenhas and Milton Leontiades for their helpful comments.

Appendix 1. Measurement of Variables

Product Diversification

Rumelt’s Classification

Sample firms were classified into Wrigley/Rumelt’s categories of i) single business, ii) dominant business, iii) related business, or iv) unrelated business by calculating the specialization, related, and vertical ratios respectively obtained from annual reports and other archival information.

Entropy Measure

Firm Total Diversification = Related Diversification + Unrelated Diversification

\[ DT = DR + DU \]

\[ DT = \sum_{j=1}^{m} DR_j P_j + \sum_{j=1}^{m} P_j \ln(1/P_j) \]

where \( m = \text{number of industry groups} \)

\( j = 1, \ldots, m. \)

\( P = \text{share of jth group sales in the total sales of the firm.} \)
International Diversification and Product Diversification Strategies

Broad and Mean Narrow Spectrum Diversity

BSD = number of 2 digit SIC codes a firm operates in.
MNSD = the number as the four digit SIC codes a firm participates in divided by the number of two digit SIC categories the firm operates in (Varadarajan and Ramanujam 1987).

International Diversification

Size of Foreign Operations

LFORSALES = Log (foreign sales to total sales)
LFORASSETS = Log (foreign assets to total assets)
Mean of two years 1985 and 1986.

Number of Foreign Subsidiaries

LNSUBS = Log (number of foreign subsidiaries)
Data was collected from Standard and Poor's and Directory of Multinationals.

Market Heterogeneity

Global market diversification (GMD) is defined as:

\[ GMD = - \sum_{i=1}^{k} S_i \ln S_i \]

where S is the ratio of a firm's number of subsidiaries in region k to the total number of its foreign subsidiaries. We defined the world into 6 regions namely, North America (Canada, Mexico, Bermuda, Puerto Rico), Western Europe, Pacific Rim (Japan, Korea, Australia, New Zealand), newly industrialized countries (Taiwan, Hong Kong and Singapore), centrally planned economies, and less developed countries.

Overall Firm Performance

Return on sales (ROS) = Net income/Total sales
Return on assets (ROA) = Net income/Total assets
Return on equity (ROE) = Net income/Stockholders equity
A mean of three years 1985, 1986 and 1987

mir vol. 35, 1995/3
Rakesh B. Sambharya

Foreign Performance

Foreign return on sales (FROS) = Foreign income/Foreign Sales
Foreign return on assets (FROA) = Foreign income/Foreign Assets
Mean of two years 1985 and 1986.

References


Rakesh B. Sambharya


