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Diversification Impact on Productivity and Performance Enhancement

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Diversification, Productivity, Performance Enhancemen An International Examinati

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Introduction

As firms continue to diversify into new i businesses, firms develop a pattern or strategy that diversification efforts, known as a corporate diversifica Corporate diversification programs outline how and plans to diversify in the future. Well-design diversification programs build on internal strengt important of which are existing manufacturing innovative expertise. However, because of desira changes to the manufacturing processes and systen product markets are being severely eroded. To prese production and resource leadership, the competitive skilled workforce must be linked with a new growth Collis, 2001). Therefore, the present study examines the manufacturing firms in the U.S. and Japan to link diversification, and product diversification in their push firm performance.

The approach to developing a better und diversification from a market- and product-based pers the countries being studied is predicated on the belief of diversification has potential to significantly enha growth and longevity. It should be noted that it is exp

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two countries being studied will exhibit different relationships among the variables being studied. Both product and market diversification are used to uncover any performance relationship differences that may exist on a national or country-specific basis. Based on previous research studies it can be argued that market diversification strategy appears to have similar levels of relevance to product diversification strategy in improving the performance of multi-national firms. However, the magnitude and direction of diversification observed in the study may differ by country. Therefore, it is important to present a comparative impact study across the two countries that will be studied, U.S. and Japan.

Literature Review

One of the most researched topics in the strategy literature is the relationship between firm performance and corporate diversification. Although this relationship has been widely studied, the fact remains that researchers are still arguing over what conclusions can be drawn. The conclusion of a recent study suggests that very little has been learned about diversification over the past two decades (Dess et al., 1995). One potentially important topic in the diversification literature that has not received adequate attention is the dynamic effect of changes in diversification strategies and their effects on firm performance across countries. Studies on the impact of the Japanese business growth slowdown from a global perspective have been hampered. Diversification studies have for a long time been viewed from what may be called an American perspective, which is usually associated with product diversification. Such an over reliance on a single conceptualization is manifestly unilateral and uninformative, being more representative of historical literature than the current multi-national research findings (Li & Atuahene-Gima, 2001; Riahi-Belkaoui, 1992; Tallman & Li, 1996). It is clear from the literature, that there are benefits to adopting both a long-term perspective and cross-cultural approach to the study of diversification.

Geringer, Beamish, and daCosta (2000) identified product diversity as a limited determinant of growth performance for Japanese manufacturing firms. It was also determined that the international diversity of sales had a negative impact on accounting performance, but a positive relationship with sales growth. Further, it was proposed that environmental variations affect strategic relationships. The resource-based theory of the firm suggests that quas shared strategic capabilities help sustain competitive ac higher performance (Teece, Pisano, & Shuen, 1997; Pandian, 1992). To make such competitive advantage over the long-term, it will be necessary to adopt a global strategy and develop the research skills to become innovative (Porter, 1990). The importance of R&D in de necessary skills to maintain a firm's innovativenes accepted. Therefore, R&D has become a critical determining a firm's long-term success (Hitt et al., 1997)

It can be concluded from the past studies, that differences are related to the degree to which a firn portfolio is related to its *core businesses* (Rumelt, relationships provide the firm with opportunities to sha across different, but related businesses, within the boun company. Synergistic benefits may be derived from such allow for the more efficient exploitation of firm resource argued, should lead to higher levels of performance. I diversification may also be helpful in stabilizing th relationship (Kim, Hwang, & Burgers, 1989). With th interest in opportunities abroad, firms are recognizing a reap the benefits of internationalizing their corporate stra

Implicit in this research is the belief that firms nationalities will perceive and/or utilize diversificati differently. Identification of these bi-national difference to diversification strategy will help to explain some c divergent outcomes in prior research studies. In add variety of differences between countries, it is argued th the U.S. share geographical asymmetry, where Japanes find themselves increasingly confined by their existi markets due to the limited geographical size of the cou other hand, the U.S. has a very large domestic market diversify, thereby suppressing the desire of U.S. firms international diversification. This asymmetrical relati result in different countries viewing diversification differ

Hypotheses

The relationship between product and market d and firm performance of U.S. and Japanese firms is the s first hypothesis. As has been previously outlined, conclusion of past research studies is that firms purs

diversification will outperform firms following a strategy of unrelated diversification. It is expected that product diversification will result in superior performance for firms pursuing related diversification regardless of the nationality of the firm. Since the measure of product diversification used in the current study is a uni-dimensional measure, a negative relationship between product diversification and performance is expected.

The results of initial studies suggest that multinational diversification will generally lead to an increase in firm profitability (Geringer et al., 1989; Kim et al., 1989). A positive relationship between multinational diversification and performance is based on several theories. First, multinational diversification will allow firms more opportunities to exploit economies of scope (sharing of assets among different lines-of-business) and economies of scale (due to larger quantities of production). Second, the skills and resources of the parent firm can be more fully utilized. Third, multinational diversification provides opportunities for firms engaged in business across international borders to exploit transfer knowledge, skill, and experience to newly developing markets which are not being adequately served. It is hypothesized that multinational diversification will have a positive impact on performance because of the economies of scale as well as the exploitation of international markets.

Hypothesis 1_a: Product diversification will be negatively associated with firm performance for both U.S. and Japanese firms.

Hypothesis 1_b: Market/international diversification will be positively associated with firm performance for both U.S. and Japanese firms.

A number of studies examined the joint effects of product and market diversification with respect to performance (Hitt, Hoskisson, & Kim, 1997; Geringer et al., 2000; Tallman & Li, 1996). Geringer and his colleagues (1989) empirically examined the effects of the interaction of product and market diversification on performance, but failed to find any significant effects. Kim (1989) also argued that the impact of product diversification on performance is contingent on the degree of multinationalization, particularly with respect to risk-adjusted performance measures. That is, product-diversified firms will outperform their counterparts when they are geographically diversified (Hitt et al., 1997). Tallman and Li (1996) reported empirical results indicating that the interaction effect of product and multinational diversity on performance controlling for the effects of firm size, leverage, and in In a recent study of the interaction effect of produc diversification on performance, Geringer and o empirically demonstrated that limited product diversit manufacturing firms did improve short-term profit whil manufacturing operations combined with limited pro tended to increase sales growth.

Hypothesis 2: The joint effect of product diver and market/international diversification performance will be positively associated performance for both U.S. and Japanese firms.

In general, product and market diversification, along related lines, is expected to result in synergies t firms in lowering their overall cost of doing business. T may be the result of economies of scale or scope. One f that has been widely identified as a critical strategic res (Baysinger & Hoskisson, 1989; Hitt et al., 1991; Hitt Baysinger and Hoskisson (1989) have provided the in evidence that suggests that diversification strategy may affect R&D intensity in large multi-product firms improve the efficiency of R&D activity through because of the exploitation of economies of scope. Ho recognized that there might be a tendency in large M- division managers to reduce expenditures in both R& product and market diversification (Baysinger & Hoskis

In early theoretical work, Caves (1982) innovative firms are more eager to launch into foreign geographic expansion) to increase or at least maintai Utilizing resource-based theory, firms engaging in diversification should be able to leverage existing applying them in new international markets. There within domestic markets or across international bou engaging in diversification will have more opportu utilize exiting resources and thereby, increase profitab et al., 2000). Thus, market/international diversification more efficiently utilize its resources across countries.

Hypothesis 3_a: R&D intensity will moderate (n relationship between product diversification a performance for both U.S. and Japanese firms

Hypothesis 3_b: R&D intensity will moderate (p

relationship between market diversification and performance for both U.S. and Japanese firms.

Methods

Sample

The initial sample for the current study started with the top 600 publicly listed manufacturing firms from the United States and Japan (rankings were based on sales revenues for the year 1999). After excluding significant outliers from the sample (below $280 million and above $47,500 million) the sample was reduce to 430 U. S. firms and 450 Japanese firms. The final sample was comprised of 405 firms from each of the two countries over the five-year period 1995-1999. The samples were analyzed separately to avoid the impact of volatile exchange rates on the final outcomes. The selected data are arithmetic averages over the five-year period in question (1995-1999). Data for Japanese firms were gathered from the *Nikkei Annual Corporation Report* and *Toyo Keizai's Japan Company Handbook*.

Measurement of Variables

Product Diversification and Market/International Diversification. Although there are a variety of different measures of product diversification, we chose to limit our study to the most commonly used continuous measures of diversification. Therefore, product diversification was operationalized using the Herfindahl index (Geringer et al., 2000):

Product Diversification $= 1 - \sum (Pi^2)$

where: Pi = the proportion of a firm's sales reported in product group i. Therefore, product diversification indicates the relative importance of each business segment in the company's portfolio.

Market (or international) diversification was measured as the proportion of a firm's sales revenue derived from overseas markets (such as global market diversification by export activity). Multinational diversification represents the relative portion of a firm's revenues derived from foreign operations and export volume (Geringer et al., 1989). Firms with higher values on the multinational diversification index represent firms that are more actively engaged in foreign trade. Multinational diversification (MLDVSF) is reflected in the following equation:

Market Diversification $= FS_i / TS_i$ where:

FS_i = sales volume of foreign trade by export in yea

TS_i = total sales of the firm in year i

Performance Measures. In an attempt to comparability of the results of the current study across of research studies in the diversification literature, we both accounting-based and market-based measures of The accounting-based performance measures include OPROS while market-based performance measures in Q and Sales Growth. The measures of firm performa used are calculated as follows

- OPROA = Operating Income /Total Assets
- OPROS = Operating Income /Total Sales
- Tobin's Q = (Market Value of Equity + Value of Preferred Stock + Total Debt)/To
- Sales Growth = (Net Sales $_t$ – Net Sales $_{t-1}$)

Control Variables. To examine the interact R&D intensity on diversification and firm perfor important to include some strategic resource variables. variables may have an impact on the linkages between and performance with respect to R&D intensity. resource variables that were used in the present study in

- R&D Intensity = Research and Expenditures/Total Sales
- Firm Size = Natural Log of Total Sales Re
- Advertising Intensity = Advertising Expe Sales
- Capital Intensity = Total Assets/Total Sale
- Debt Leverage = Book Value Debt/Shareholders' Equity
- Market Risk = Standard Deviation of M Return (by monthly closing stock price)

Results and Discussion

Descriptive Statistics and Intercorrelations

The results of the regression analysis can be fo 1 (U.S. firms) and 2 (Japanese firms) and can be s follows: (1) the direct relationships between diversifica performance and (2) the moderating effect of R&D in diversification/performance relationship with respect to

performance measures for each of the two samples. The results of the regressions are presented in Tables 1 and 2. All regression models for both U.S. and Japanese firms were highly significant ($p<.001$), indicating that the multiple regression models were useful in explaining the relationship between diversification and corporate performance across the two countries being studied.

In analyzing the descriptive statistics for the variables used in the current study some interesting findings should be highlighted. First, the Japanese sample shows a greater degree of diversification than the U.S. sample, for both product and market diversification. That is, Japanese firms are more likely to be active in diversifying along both product and international lines. Second, the U.S. sample reflects a generally negative relationship between product diversification and performance with respect to accounting-based performance ($p<0.05$) while the Japanese sample reveals a consistent and positive relationship with all performance measures. Third, market diversification is uniformly and positively related to firm performance irrespective of the performance measures used for both U.S. and Japanese firms. Fourth, product diversification tends to exhibit a negative correlation with R&D intensity among U.S. firms, but is positively correlated with Japanese firms. However, when we looked at the effects of R&D intensity on market diversification, we found a positive association for both U.S. and Japanese firms. These results suggest that R&D efforts are correlated with a global strategy across countries.

Product Diversification and Performance. The results (Tables 1 and 2) indicate that hypothesis H_1 was not uniformly supported. The results varied across countries and were dependent on the performance measure used. For instance, when looking at U.S. firms, product diversification is significantly and negatively associated with accounting-based performance only (OPROA, OPROS), but positively related when performance is measured using market-based measures (Tobin's Q and market growth). However, with the exception of OPROA ($p<0.10$), product diversification is positively associated with all performance measures for Japanese firms. Although the results show different signs with regard to the two accounting-based performance measures in the two samples, product diversification reflects a significant and positive relationship with market performance measures for both U.S. and Japanese firms.

When we look at the product diversification index squared (to test for a curvilinear relationship), the resulting relationships were

mixed. For U.S. firms, there is a negative curvilinea between product diversification and performance, par respect to most accounting-based performance measu OPROS). Contrary to U.S. firm results, there is a positiv

Table 1
Results of Regression Analysis: US

Independent Variable	Accounting-based Performance OPROA	OPROS	Marke Tobin's Q
Control Variables			
Firm Size	-0.112*	-0.041	0.307*
Debt Leverage	-0.148**	-0.084*	-0.103*
Advertising Intensity	0.028	0.082*	0.024
Risk	-0.162**	-0.216**	-0.038
Capital Intensity	-0.320***	0.167**	0.108*
Main Effects			
R&D Intensity	0.189**	0.214***	0.257*
Product Diversification	-0.185**	-0.122*	0.134*
Market Diversification	0.169**	0.205**	0.123*
Product Diversification x Market Diversification	0.153**	0.158**	0.051
Interaction (Moderating) Effects			
R&D Intensity x Product Diversification	0.137*	0.236**	0.161*
Market Diversification	0.046	0.102*	0.204*
Product Diversification & Market Diversification	0.126*	0.118*	0.153*
R^2	0.302	0.310	0.321
F	11.52***	22.20***	13.21**

[a] For this model, n = 405. Values are standardized regression
+ P < .10; * P < .05; ** P < 0.01 **

function between product diversification and OPRO growth ($p<0.05$) only for Japanese firms. It may Japanese firms are more likely to rely on sales a measures of performance to a greater extent than do U.S. cohort reflected a tendency to make use of m based measures of performance (OPROA, OPROS). F of the regression analyses it can be concluded th diversification is differently associated with vari

performance across countries and (2) there is evidence of a curvilinear relationship between performance and product diversification with respect to short-term performance measures for the U.S. firms and sales related performance measures for Japanese firms. Thus, our proposed hypothesis (H1a) was partially supported, particularly with respect to accounting-based performance for both countries.

Market Diversification and Performance. With respect to the impact of market/international diversification on performance, the results show a positive relationship between market diversification and most performance measures for both U.S. and

Table 2
Results of Regression Analysis: Japanese Firms[a]

Independent Variable	Accounting-based Performance OPROA	OPROS	Market-based Performance Tobin's Q	Market Growth
Control Variables				
Firm Size	0.071	0.054	0.132**	0.203**
Debt Leverage	-0.126*	-0.120*	-0.140**	-0.017
Advertising Intensity	0.120*	0.178**	0.023	0.203**
Risk	0.038	0.053	-0.029	0.198**
Capital Intensity	-0.316***	-0.254***	-0.174**	-0.057
Main Effects				
R&D Intensity	0.089*	0.287***	0.206**	0.298***
Product Diversification	0.090*	0.212**	0.122*	0.214**
Market Diversification	0.129*	0.247***	0.213**	0.276***
Product Diversification x Market Diversification	0.089*	0.201**	0.128*	0.204**
Interaction (Moderating) Effects				
R&D Intensity x Product Diversification	0.076	0.090*	0.085*	0.131*
Market Diversification	0.129*	0.213**	0.109*	0.210**
Product Diversification & Market Diversification	0.087*	0.101*	0.205**	0.215**
R^2	0.231	0.314	0.310	0.324
F	4.59***	6.58***	7.35***	12.57***

[a] For this model, n = 405. Values are standardized regression coefficient
+ P < .10; * P < .05; ** P < 0.01; *** P < 0.001

Japanese firms. A curvilinear function was market/international diversification for both U.S. and Ja However, curvilinear functions between market diver performance were more clearly evident in both the U.S. samples for international diversification. Such findings with previous studies that have uncovered a curvilinea between international diversification and performanc 1997; Gomes & Ramaswamy, 1999), indicating that inc of multinational diversification will bring significan benefits up to a certain optimum level beyond which be decelerate while costs accelerate. Thus, hypothe supported.

Joint Effects of Product and Market Dive Performance. For combined effects of product dive market diversification on performance, the intera product- and market-diversification was significant ar both U.S. and Japanese firms although there were so depending on which measures of performance we interaction effect was consistently positive and Japanese firms with respect to most performance m OPROA ($p<0.10$). However, the interaction effect showed a positive and significant effect only performance ($p<0.01$) measures. Therefore, hypot supported. The difference in the relationships of across countries may reveal idiosyncratic persp countries. For U.S. firms, the results seem to be in previous studies (Geringer et al., 1989; Tallman & failed to find any significant interaction effects betwe market diversification on performance. Also, the pres in part be due to the different diversification mea operationalize product diversification (for exampl unrelated, entropy measure vs. Herfindahl index).

Moderating Effect of R&D Intensity on th Between Product and Market Diversification and Tables 1 and 2 present the results of the moderating intensity on the diversification/performance relationsh Japanese firms ($H3_a$ & $H3_b$). Adding the multiplicativ R&D intensity by product diversification in the regres U.S. and Japanese firms resulted in significant equati indices of performance measures. For U.S. firms,

between product diversification and R&D intensity was significant and positively related to all performance measures. However, the interaction between product diversification and R&D intensity was positive and significantly related to only one market-based performance measure (market growth) for the Japanese firms. Contrary to our proposition, the moderating effect of R&D intensity on the relationship between product diversification and performance varied with the different indices of performance across bi-national firms.

In contrast to the moderating effect of R&D intensity on product diversification and performance, R&D intensity served as a positive moderating variable on the relationship between market diversification and performance for both U.S. and Japanese firms. The interactions of R&D intensity by market diversification are significant at the $p < 0.01$ level and positively associated with all performance measures except with OPROA for U.S. firms. For Japanese firms, R&D intensity by market diversification yielded significant effects for all performance measures. Thus, hypotheses $H3_a$ & $H3_b$, which proposed a positive interaction effect of R&D intensity on the market-diversification/performance linkage was supported among both U.S. and Japanese firms. In addition, the combined effect of product and market diversification on performance was moderated by R&D intensity for various indices of performance across both samples. Furthermore, the regression model with interaction terms contributed significantly to the prediction of firm performance by diversification for both U.S. and Japanese firms.

Conclusions, Limitations, and Issues for Future Research

In summary, our results indicate that product diversification and multinational diversification have differing impacts on corporate performance, depending on the country being studied. The major findings of this study suggest that product diversification has a detrimental impact on corporate performance only with respect to U.S. firms using accounting-based measures of performance. Japanese firms, on the other hand, reported positive relationships between firm performance and product diversification irrespective of which performance measures were used. However, the strategic impact of product diversification on corporate performance may vary over time, rather than being fixed (Geringer et al., 2000). When

diversification was measured as market diversificatio
mixed depending on the country and the measure o
being used. These results may be due, in part, t
performance indices employed in the present stud
country-specific differences in economic, political,
environments.

In concert with the insignificant effect
diversification on firm performance, one possible expl
superior role of market diversification in the case of
may be that Japanese multinationals are attempting
competitive powers by strategically focusing on e
penetration with high-tech oriented products (such a
electronics, and precision and measurement products).
on the foreign market, as opposed to developing
markets, could be a major strategy for gaining
advantage within foreign markets. More importantl
strategic alliances (internal and external) may enhanc
manage diversification efficiently from within the
Japan. Nationally peculiar and conglomerate-based
governance systems (MITI for example) may offer
advantages for market diversification. Such idiosyncra
may help explain the differences observed between
Japan samples.

In a previous study, Eun and Resnick (1994
both U.S. and Japanese investors could benefit from
diversification. However, it was concluded that the
returns/gains, with the exception of sales growth, wa
for U.S. investors than for Japanese investors. The
current study suggest that such a conclusion ma
premature, and that understanding why such c
relationships exist should be the subject of further in
would also be useful to explore the reason why Japane
seem to suffer the ill effects of increased product dive
the U.S. firm do. The best explanation for this phenom
the structural and cultural features of Japanese firms.
diversification appears to be a logical strategy in o
economies of scale and scope, as well as having a be
on corporate performance. There are preliminary indic
firms would also benefit by increasing their foreign
export activities. These diversification strategies need
evaluated to ensure their potential for increasing perfor

This study was an exploration of the basic nature of the relationships between two major types of diversification (product and market/international) and firm performance with respect to various indices of performance for two important countries in the global economic context. Indeed, diversification strategies, whether product- or market-based should be carefully evaluated to ensure their viability before being used. It is understood that as we continue to learn more about these economies, that this information may lead to future strategic alliances between the two countries under review. Although the issue of causality is of interest to all strategy scholars, it did not fall within the parameters of the current study and, therefore, was not directly addressed. Further investigation into the causal relationships of these variables should be addressed in future research.

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