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Revisiting the Link Between Product and Industry: Diversification and Corporate Performance

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Extensive research has focused on the impact of diversification on performance. Current theory and thinking in practical circles is that diversification has a positive impact on performance through risk reduction. The underlying assumption is that firms choose to reduce risk through diversification, which then improves performance, especially in transitional economies with high levels of uncertainty. However, this theoretical assumption begs the question of whether firms that perform differently actually choose a different diversification strategy. That is, is it possible that performance actually has an impact on the firm's diversification strategy, rather than the reverse? In this paper we argue (1) prior performance directly relates to diversification strategy, and (2) that appropriate understanding of the impact of diversification strategies on performance requires consideration of prior performance.

Field of Research: International Business Strategy, Risk Management, Diversification, China

1. Introduction

Since Rumelt's (1974) pioneering study, an extensive research effort has focused on the impact of diversification on firm performance. The typically cross-sectional empirical investigations of firm performance of related versus unrelated diversifiers implicitly assume that related and unrelated diversification strategies are randomly selected by firms.

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Investigations control for variables such as firm size, industry performance, etc. and their effect on performance, but they do not control for such variables and their effect on choice of diversification strategy. Surprisingly, the causal direction in the diversification-performance linkage has been assumed but not tested. There is almost no research examining firm performance effects on corporate diversification.

Typical studies do not take into consideration that it is not always how much a firm diversifies, but also how the firm diversifies that matters. Since it is reasonable to assume that managers make purposeful, strategic decisions regarding product/industry diversification, we would expect firms to choose appropriate strategies. Current thinking suggests that more diversification reduces risk, which leads to better performance. Yet, extensive empirical research has created a level of consensus in the literature that related diversification outperforms unrelated diversification (Datta, Rajagopalan, and Rasheed, 1991). More diversification need not necessarily improve performance. In fact, one could argue that current thinking encourages broader diversification than is warranted, suggesting that firms selecting unrelated diversification on average have poorer managers.

In this paper we examine an alternative explanation for the performance difference between related and unrelated diversifiers that firm performance affects diversification. We examine the possibility that higher performance firms more likely choose the related diversification strategy and, vice versa, that lower performance firms more likely choose the unrelated diversification strategy. In other words, performance actually drives diversification rather than the reverse. We posit two reasons for this possibility. On the demand side, low prospects of future profitability in existing activities might be expected to create incentives for diversification (S.J. Chang 1996); on the supply side, high profits from existing activities can be used to finance diversification to take advantage of additional opportunities (Gort, Grabowski and McGuckin 1985). We study 88 Chinese companies between the years 1997 and 2001, finding that performance does indeed influence diversification strategy and subsequent impact on performance.

2. Literature Review

The existing literature on the diversification and performance relationship represents perhaps the most substantial body of work in business strategy. One major stream of empirical work in this literature, spurred especially by Rumelt's (1974; 1982) early seminal research, tests the hypothesis that firms adopting a strategy of related diversification outperform those using unrelated diversification. Extensive reviews of this work are provided by Datta, Rajagopalan and Rasheed (1991), Ernest and Lee (1999), and Palich, Cardinal and Miller (2000). These reviews conclude that much has been learned, that some level of consensus has

been reached on the comparatively superior performance by related diversifiers, but also that there are continuing inconsistencies in the findings from more than 30 years of research, while new efforts are focused on trying to explain these conflicts.

One prominent avenue taken in these new efforts points to the linear versus non-linear (curvilinear) form of modeling the diversification-performance relationship (Palich, Cardinal and Miller 2000). The findings to date suggest that moderate levels of diversification yield higher levels of performance than either limited or extensive diversification. Thus, if such a hypothesis is correct, simple linear models may well lead to results that are either positive or negative, but in all cases rather weak. Where linear models generally were applied in the literature prior to the 1990s, a curvilinear reality would then go some distance in explaining conflicting or weak results.

Others have posited different tools for measuring diversification and performance (Vachani 1991, Gassenheimer 1998, Hoopes 1999), while several articles question the validity of applying the traditional diversification model to all countries and all time periods (Ernest & Lee 1999, Gassenheimer 1998, and Geringer 2000). Another avenue for explaining conflicting results has been to introduce new moderator variables into traditional models. Researchers have considered multi-nationality (Kim, Hwang and Burgers 1989; Sambharya 1995, Tallman & Li 1996, Simmonds and Lamont 1996), ownership (Li et al 1998, Zhao and Luo, 2002; Luo 2002), R&D expenses and debt level (Qian 2002), marketing capabilities (Ernest & Lee 1999; Kotabe 2002) and entry mode (Busija, Neill and Zeithaml 1997) as potential contributors to the link between diversification and performance.

While important insights have been gained, prior research has almost exclusively focused on the unidirectional link between product diversification and performance. This may represent a crucial omission in the previous literature. If different initial performance levels imply different subsequent diversification strategy choices, and if initial performance levels show some level of persistence over time, then the performance impact of different diversification strategies will not be properly reflected in cross-sectional studies. Therefore, in this article we examine empirically the impact of initial performance differentials on subsequent diversification strategy and, controlling for initial performance differentials, the subsequent performance impact of alternative diversification strategies.

3. Hypotheses

To test the impact of performance on diversification, we offer several exploratory hypotheses. First, we posit that firms with lower profitability, be it due to their presence in a low profit industry or due to their own relative lack of competitiveness in their industry, will be more inclined to search for new opportunities, while firms with higher profitability will be better advised to concentrate their efforts and

investment on their current activities to maximize current levels of high profits. Hence, we posit,

Hypothesis 1: High profitability encourages reducing diversity, while low profitability encourages increased diversity.

Implicit in H1 is the assertion that the performance impact of alternative diversification strategies will depend on the initial performance level of the firm. Thus we speculate that low profitability firms who pursue a diversification strategy (increasing diversity) should perform better than low profitability firms who do not pursue a diversification strategy. Similarly, high profitability firms who pursue a diversification strategy should underperform high profitability firms who do not pursue a diversification strategy.

Hypothesis 2: For low-profitability firms, increasing diversification is positively associated with profit growth.
Hypothesis 3: For high profitability firms, increasing diversification is negatively associated with profit growth.

As a second test of diversity and its impact on future performance, we also examine diversity and sales growth since firms have the option to trade profit growth for sales growth (Choi and Cowing 1999). We further posit,

Hypothesis 4: For low-profitability firms, increasing diversification is positively associated with sales growth.
Hypothesis 5: For high-profitability firms, increasing diversification is negatively associated with sales growth.

4. Methodology

We drew our sample of firms from the Shanghai stock market 180 index. These 180 firms represent about half of the total market value of the Shanghai stock market, and because of their size and visibility have more reliable information than smaller firms. Our study timeframe, 1997-2001, was determined first by the ready availability of company accounting data and covers the period of the Asian financial crisis, which greatly intensified competition and pushed firms in this market to make rapid product diversification decisions. Missing data reduced the sample to 88 firms reporting divisional sales data across the entire 5 year period.

Given the Chinese context, we used the China Security Regulation Committee (SCRC) industrial subgroup classification categories to calculate the degree of product/industry diversification. Cross-sectional sales revenues reported by the listed companies in their annual reports are based on the CSRC industrial

classification scheme, classifying industrial activities into 93 subgroups. We used the sales based entropy measure of total product diversification (Jacquemin and Berry 1979).

We used two ratios as profit performance measures: operating profit margin (OPM) and return on assets (ROA). The first ratio, also called return on sales (ROS), is used to measure the relative efficiency with which the firm produces and markets its output and is particularly well suited to reflect the attainment of synergies in business operations through diversification. The latter ratio is widely used as a profit performance measure in diversification research, assessing the relative efficiency in the utilization of the firm's total assets. We used growth rather than absolute measures of profit and ROA to more accurately reflect useful comparisons. Following Kim, Hwang and Burgers (1989), we used a growth statistic tested by Hunter and Coggin (1983). Such measures have been used successfully before (e.g., Grant et al. 1988). We controlled for industry membership (Gassenheimer & Keep 1998). firm size (Shepherd, 1975; Winn, 1977), leverage (Singh et al 2001), and initial level of diversity (e.g., Grant et al 1988, Singh et al 2001) which have all been tied to the diversity—performance link.

We used hierarchical regression to test H1 (e.g., Grant et al. 1988) examining changes of diversification over two time periods: 1997-1999 and 1997-2001. For H2-H5 we divided our sample firms into two groups based on their ROA and ROS performance in 1997, with 44 firms in the high profitability group and 44 firms in the low profitability group. We then compared the means of the performance changes between those choosing different strategies (increase diversity vs. reduce) in each group to test the effect of diversification. Given the availability of data, 1997-1999 was chosen as the diversification implementation time period. Sales growth and profitability growth are examined in detailed fashion first for the implementation time period (1997-1999), then for the post-implementation time period (1999-2001), and finally for the full observed time period (1997-2001).

5. Findings

Table 1 presents the regression of diversification on profitability. We can see that initial profitability levels are strongly related to firms' changes in diversity levels as well as industry and firm size. In the analysis of the first 2.5-year period, ROS and ROA in 1997 both exhibit a significantly negative relationship with increasing diversity during the 1997-1999 timeframe. Industry membership, firm size and initial diversity play important roles in firm's diversification decisions. H1 is supported.

Table 1. Results of Regression of Diversification on Profitability

Independent Variables	Diversification (97-99)		Diversification (99-01)	
	ROA	**ROS**	**ROA**	**ROS**
Industry groups				
Food, Textile and Clothing	-0.101	-0.105	-0.238 **	-0.227
Petroleum Chemical, Plastics	-0.111	-0.115	-0.198	-0.194
Metal goods and Machinery	-0.081	-0.091	-0.192	-0.190
Medicine and Biologic product	-0.210 **	-0.214 **	-0.412 ***	-0.414 ***
Electronics and communication	-0.086	-0.098	-0.188	-0.198 *
Public Service	-0.107	-0.099	-0.171	-0.159
Trade, Travel and Hotel	-0.061	-0.043	-0.275 *	-0.215
Real estate and Construction	-0.137	-0.138	-0.147	-0.156
Other Business	0.237 **	0.231 **	0.032	0.027
Firm structure				
Firm size 1997	-0.161 ***	-0.154 ***	-0.260 ***	-0.265 ***
Leverage 1997	0.076	0.081	0.093	0.155
Diversity 1997	-0.140**	-0.140**	-0.301 ***	-0.307 ***
Profitability				
ROA of year 1997	-0.008 **		-0.013 **	
ROS of year 1997		-0.005 **		-0.006 **
Constant	1.665***	1.581***	2.823***	2.749***
R square	0.349	0.348	0.317	0.319
Adjusted R square	0.234	0.234	0.197	0.200
R square due to				
Industry groups	0.189	0.189	0.070	0.070
Leverage, diversity and size	0.115	0.113	0.197	0.212
Profitability variables	0.045	0.046	0.050	0.037
F	3.047 ***	3.042 ***	2.643 ***	2.670 ***
N	88	88	88	88

* P<0.10 ** P<0.05 *** P<0.01

Table 2 gives more detailed information on the profitability-diversity relationship. During the 1997-1999 time period (in the first part of Table 2), among companies with low profitability, nearly all of those who chose to change their diversity level increased their scope. Meanwhile, among companies with high profitability, the number of firms who choose to decrease their diversity is significantly greater than in the low and medium profit groups. All these results add support to H1. High profitability encourages specialization, while low profitability encourages diversification. In the analysis of the 5-year period in Table 1, ROS and ROA in 1997

still exhibit a strongly negative and significant relationship with diversification in the years following, though not as strongly as was the case for results during the 1997-1999 timeframe. These results reflect a decreasing effect of initial profitability over time.

Table 2. Firms within different profitability and diversification groups

97-99 time period

Diversity changes	ROS 1997 Low	Medium	High	Total	Diversity changes	ROA 1997 Low	Medium	High	Total
Decrease	1	4	12	17	Decrease	2	8	7	17
No change	16	17	8	41	No change	14	11	16	41
Increase	12	9	9	30	Increase	13	11	6	30

99-01 time period

Diversity changes	ROS 1997 Low	Medium	High	Total	Diversity changes	ROA 1997 Low	Medium	High	Total
Decrease	2	5	10	17	Decrease	4	8	5	17
No change	12	11	7	30	No change	11	7	12	30
Increase	15	14	12	41	Increase	14	15	12	41

The results of mean comparisons on performance differences between firms with different strategies are reported in Tables 3 and 4.

Table 3a. Mean comparison for Firms With Low ROS in 1997 (44 companies)

		Sale growth 97-99	Sales growth 99-01	Sales growth 97-01	Growth of ROS 97-99	Growth of ROS 99-01	Growth of ROS 97-01
Firms Choosing Diversification strategy(97-99)	N	14	14	14	14	14	14
	Mean	2.494	1.568	3.478	15.5253	-25.607	-3.541
	Std dev.	3.374	0.903	3.914	32.910	24.469	13.871
Firms Not-choosing diversification strategy(97-99)	N	30	30	30	30	30	30
	Mean	1.281	1.282	1.674	12.038	-16.066	0.271
	Std dev.	0.588	0.524	1.018	46.683	36.418	31.517
T-Test for Equality of Means	Mean difference	1.213	0.285	1.804	3.4875	-9.541	-3.811
	Std-error difference	0.628	0.260	0.756	12.248	9.326	6.845
	T	1.932	1.100	2.385	0.285	-1.023	-0.557
	Sig.	0.060 *	0.287	0.022 **	0.778	0.313	0.581

- p<0.1 ** p< 0.05 *** p< 0.01

Table 3b. Mean comparison for Firms with High ROS in 1997 (44 companies)

		Sale growth 97-99	Sales growth 99-01	Sales growth 97-01	Growth of ROS 97-99	Growth of ROS 99-01	Growth of ROS 97-01
Choosing Specialization strategy(97-99)	N	15	15	15	15	15	15
	Mean	1.989	1.305	3.643	-15.493	-19.313	-15.375
	Std dev.	1.099	0.811	3.610	27.241	16.568	11.212
Not-choosing Specialization strategy(97-99)	N	29	29	29	29	29	29
	Mean	1.551	1.543	2.253	-2.671	-17.138	-9.047
	Std dev.	0.602	0.826	1.008	13.489	15.990	8.769
T-Test for Equality of Means	Mean difference	0.438	0.062	1.391	-12.822	-2.175	-6.328
	Std-error difference	0.255	0.259	0.713	6.107	5.207	3.322
	T	1.714	0.238	1.951	-2.100	-0.418	-1.905
	Sig.	0.094*****	0.813	0.058*	0.042**	0.679	0.069*

- p<0.1 ** p< 0.05 *** p< 0.01

Table 4a. Mean Comparison for Firms With Low ROA in 1997 (44 companies)

		Sale growth 97-99	Sales growth 99-01	Sales growth 97-01	Growth of ROA 97-99	Growth of ROA 99-01	Growth of ROA 97-01
Firms Choosing Diversification strategy(97-99)	N	13	13	13	13	13	13
	Mean	2.717	1.664	3.769	8.542	-23.274	-5.9047
	Std dev.	3.456	0.816	3.780	23.352	32.951	16.723
Firms Not-choosing diversification strategy(97-99)	N	31	31	31	31	31	31
	Mean	1.367	1.442	1.988	3.319	-13.274	-2.687
	Std dev.	0.701	0.875	1.780	49.806	32.908	27.499
T-Test for Equality of Means	Mean difference	1.351	0.222	1.781	5.223	-10.053	-3.218
	Std-error difference	0.641	0.276	0.832	11.044	10.884	6.775
	T	2.107	0.806	2.140	0.473	-0.924	-0.475
	Sig.	0.041**	0.428	0.038**	0.639	0.365	0.638

* p<0.1 ** p< 0.05 *** p< 0.01

Table 4b. Mean Comparison for Firms with High ROA in 1997 (44 companies)

		Sale growth 97-99	Sales growth 99-01	Sales growth 97-01	Growth of ROA 97-99	Growth of ROA 99-01	Growth of ROA 97-01
Firms Choosing Specialization strategy(97-99)	N	11	11	11	11	11	11
	Mean	2.042	1.580	3.652	-20.553	-29.140	-23.247
	Std dev.	1.0896	0.7509	3.538	16.147	15.745	8.6036
Firms Not-choosing Specialization strategy(97-99)	N	33	33	33	33	33	33
	Mean	1.4554	1.3800	2.0636	-22.289	-24.994	-21.350
	Std dev.	0.5837	0.5844	1.2958	21.546	19.384	15.532
T-Test for Equality of Means	Mean difference	0.5875	0.2005	1.5889	1.7367	-4.4146	-1.8972
	Std-error difference	0.2564	0.2482	0.7186	6.1458	5.8245	3.7470
	T	2.291	0.808	2.211	0.283	-0.712	-0.506
	Sig.	0.027 **	0.432	0.033 **	0.780	0.484	0.616

* p<0.1 ** p< 0.05 *** p< 0.01

In the low profitability group (in Tables 3a and 4a), firms choosing a diversification strategy in 1997-1999 had a higher profitability growth in the period of 1997-1999 than those not choosing such strategy, but the relationship is not statistically significant. However, we do find that sales growth rates are significantly and positively related to diversification. Firms in the low profitability group who pursued diversification during the 1997-1999 timeframe achieved a significantly higher level of sales growth both during the 1997-1999 and the 1997-2001 time periods when compared to those firms in the same low profitability group who did not pursue diversification. The lagged effect of diversification in period 1999-2001 could not be found either in profitability or sales growth analysis. Hence, H2 and H4 are only partially supported.

For the high profitability group (in Tables 3b and 4b), firms choosing the specialization strategy exhibit a significantly greater decline in ROS in both the implementation period of 1997-1999 and the full observed time period of 1997-2001, though this effect is not statistically significant for ROA. For sales growth, the results show that specializing firms exhibit a significantly higher sales growth than those who do not choose such a strategy. The negative relationship between sales growth and increases in diversification is quite different from those we found in low profitability group. H3 and H5 also are only partially supported.

6. Conclusion and Implications

This study analyzed the causal relationships between product diversification and corporate profit and sales growth performance, though we approached the issue from the performance to diversity directional link. We found that initial profitability levels had a significant impact on the firms' diversification strategies. High profitability encouraged specialization, while low profitability encouraged diversification. Overall, it appears that the choice of alternative strategies is not random, and that different choices produce different results based on firms' initial profitability performance levels. Specifically our empirical results show that low profitability firms who increase diversity and high profitability firms who reduce diversity both achieve higher sales growth than their opposites. The results for changes in profitability subsequent to changes in diversity showed no clear pattern.

The study has some limitations that restrict its generalization. First, as argued by Ernest and Lee (1999), diversification models may not be applied to all countries. While our approach and assumptions seem appropriate for China during this period when competitive pressure and multiple opportunities abounded, other markets may yield different results. Second, Geringer, Tallman and Olsen (2000) have shown that diversification strategies and their effects on performance may vary across time periods. Our data reflected firms' actions during a volatile period rife with both difficulty and opportunity.

Notwithstanding these limitations, we believe that our results do shed some new light on the relationship between changes in product diversity and corporate performance. First, our results imply that neither diversification nor specialization will be the better strategy for all companies. Different companies should choose different strategies based on their particular situation, as well as based on the particular opportunities and challenges offered by their environment. Second, our results suggest that traditional methodologies employed for testing diversification-performance relationships need to be reconsidered. It appears inappropriate to take a large sample of companies and simply relate performance to diversity. It appears more fruitful to conceive of alternative strategies as responses to alternative challenges, and to investigate the conditions under which different responses are more appropriate for different challenges.

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