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Firm size as a moderator of the relationship between business strategy and performance in indian automotive industry

Abstract

Miles and Snow's strategy typologies have been widely employed to describe various business strategies within a given industry and its relationship with performance as well. Numerous empirical studies have been conducted in abroad on strategy–performance relationship, while little attention has been focused on the moderating effect of size of the firm on the strategy and performance relationship. No research has been carried out on this topic related to Indian automotive industry. This study explicitly investigates the effect of firm size in moderating the relationship between strategy and performance of automotive companies in India. Findings are drawn from the analysis of the primary data collected from CFOs representing 18 automotive companies operating in India and secondary data collected from CMIE, Prowess data bases.

Introduction

Today's business is characterised by complex nature which drives the companies to practice some form of strategic management to formulate and implement strategies in order to be successful in this globally competitive and rapidly changing business environment. Each company follows a strategy in its efforts to achieve the organisational goal. Strategies spell the fundamental steps to be followed by a company and give directions in its process of effective and efficient resource allocation. Each company can have a single or multiple strategies and it may be at three different levels viz., business level, corporate level, and functional level. This study focuses on the strategies followed by automotive companies at the business unit level or in short the business strategy level. Most researches on business strategy have sought to validate and test any

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one of the two schools of thought viz. typologies developed by Porter's (1980) differentiation and low cost strategies and Miles –Snow's (1978) typology of Prospector, analyser, defender, and reactor strategies. Depending on the strategy adopted, a company may give emphasis to one or more of the following aspects such as technological position, innovation, organisational design, and so on. These aspects largely determine the firm performance and efficiency of business (Slater and Narver, 1993).

Performance of a company is not only determined by the business strategy, among other factors, how well the company is able to deal with the contingency factors viz. environment and firm size, may also play an important role. A company must adopt a business strategy that fits with its environment. Such a strategy tends to perform well. Hence the company should assess the environment properly before formulating the strategies. Although a company formulates a suitable strategy, without adequate resources, one could not implement the same. Therefore one needs to consider "firm size" as one of the most important contingency variables while measuring the relationship between strategy and firm performance, because it alters the relationship between strategy and performance (Hofer, 1975).

Considerable attention has been given on the strategy and performance relationship (for example, Hambrick (1983 & 2003), Tim blumentritt and Danis (2006), Antonio Aragon–Sanchez and Greorio Sanchez Martin (2005), Ho and Pike (1998), Ramaswamy and Thomas (1994 & 1996), Pleshko (2007), Short, Ketchen, and Palmer (2007), Kitima Tamalee et.al., (2008), Parnell (1997), Weston and Tang (2006), Smith et.al (1989), Jennings et al (2003),) and others). We could find disparate results towards the relationship between these two variables i.e. strategy and performance. Therefore, we are interested to investigate how business strategy influences the performance of automotive industry in India. Specifically, it is intended to examine

whether the performance of automotive companies vary with the business strategy adopted by them. Furthermore, it is surprising to note that few studies have investigated on the relationship between business strategy–performance and considered firm size as moderator of that relationship and found that business strategy and firm size can influence organisational performance (Simth etl.al (1989)). Therefore, this study would also aim to examine the level of influence firm size has on the relationship between strategy and performance.

Background and Rationale of the Study

Over the years, Researches on strategy and performance relationship is well documented in many countries. Findings of the previous research indicate disparate results. For example, Namiki (1989), Parnell (1997), Jennings et.al (2003), Tamalee et.al., (2008) found that there is no significant difference in performance among the firms that followed four different strategies of firms. Contrary to the above findings, Smith, Guthrie and Chen (1989) found that the four strategies resulted in significant differences in firm performance on all measures. Parnell and Wright (1993) showed that for a single industry, prospectors outperformed other strategists in terms of sales growth, but analyzers performed better in terms of return on assets. Mohd Khairuddin Hashim et.al (2003 & 2000) adopted Porter's model and found that the performance of SMEs vary with their choice of business strategy. Therefore, it is clear from the above discussion that previous empirical researches have not arrived at a consensus with regards to the definite relationship between business strategies and performance or which strategies are best.

However, few studies examined the influence of some variables such as technology, firm size and environments on the strength of the above said relationship i.e. strategy–performance relationship. Lina anatan (2006) found that hard technology moderates the relationship
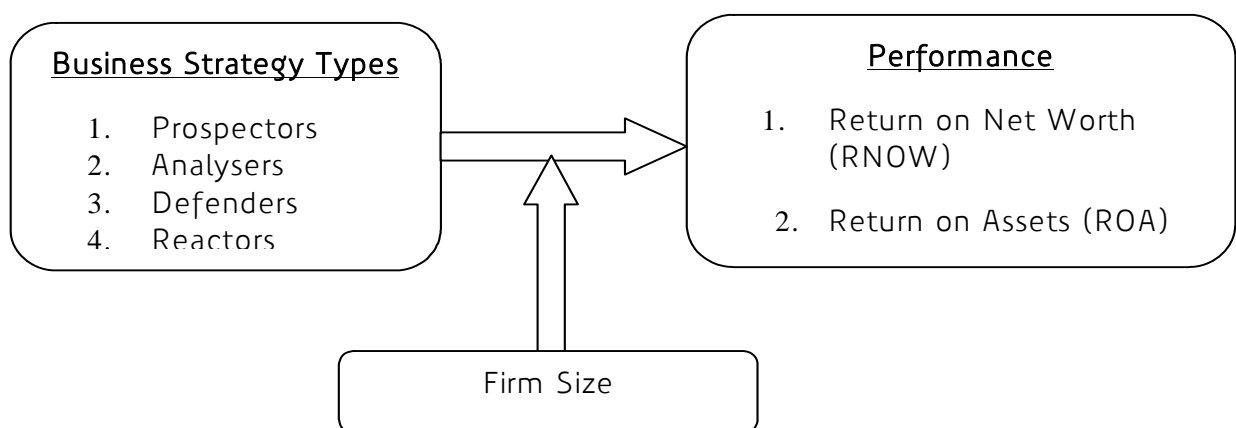
between manufacturing strategy and operational performance, as a quase moderator variable. Conversely, soft technology has an impact on the manufacturing strategy-performance relationship as an independent predictor variable, but it doesn't moderate the relationship between manufacturing strategy and operational performance. Mohd Khairuddin Hashim et.al identified that technology moderates the relationship between strategy and the performance of SMEs. Also they opined that the relationship between business strategy and performance of SMEs is moderated by the environment. Prescott (1986) demonstrated that environments, as measured by characteristics of market structures, moderate the strength but not the form of relationship between strategy variables and performance. Hofer (1975) and Simth et.al (1989) found that firm size explain differences in the relationship between strategy and performance. The above discussion leads us to examine 'whether companies in India use different strategies to produce correspondingly different results or not?', and whether firm size play a moderator role on the relationship between strategy and performance or not?"– which are the driving force behind this study.

Hypothesis Development

The basis of contingency theory is that the survival and effectiveness of an organisation depends on how well its strategy, structure and context fit one another. For withstanding the uncertainties of the global financial crises, it is critical for automotive companies to understand the relationship between strategy and performance. It is helpful to formulate the best strategy in order to perform in the best possible manner even at crises scenario. Based on this need, we present the research model of the present study in figure 1. In order to test the proposed relationship between business strategy (using Miles and Snow typology, 1978), firm size and performance, this study has the following hypotheses:

▪ The performance of Indian automotive companies does not vary with the types of business strategy adopted by them and its firm size.

▪ The firm size will moderate the relationship between business strategy and the performance of Indian automotive companies.

Figure 1: Research Model

Business Strategy Types

1. Prospectors
2. Analysers
3. Defenders
4. Reactors

Performance

1. Return on Net Worth (RNOW)

2. Return on Assets (ROA)

Firm Size

While formulating the above hypothesis, it is assumed that the company will be categorised as applying only one types of business strategy (i.e. prospector, or analyser or defender), not mixed strategies.

Methodology

Data: This study used both type of data. The primary data has been collected through pre-tested questionnaire. The questionnaire was adapted from Ho & Pike (1998) with a few adjustments made to incorporate the forces present in Indian environment and the objectives of the study as well. There are 500 automotive companies operating in India, of which 146 companies are listed and traded companies in NSE and BSE (The information is collected from CMIE, Prowess Data Base as on 28th August 2008) which is used as the sampling frame of this study. From the above stated database we could obtain the names of senior finance professionals through the company's annual reports and their website concerned for 60 companies only. The questionnaire was addressed to the senior finance professionals (CFO, General Manager-Finance, Vice President-Finance, controller etc.) of 60 companies along with a covering letter which served as an introduction to the purpose of the survey and assured the confidentiality of the information supplied by each respondent. After reminders through mail and telephone calls, assistance from friends and colleagues, we received 18 questionnaires (a response rate of 30 per cent). The response rate is better than other previous studies (20 per cent of Ashish Kumar & Bhavin Shah (2006), 15.43 per cent of Manoj Anand (2002), nine per cent of Graham and Harvey (2001)).

Variables of the Study

Business Strategy: This study used the business strategy types as conceptualised by Miles and Snow (1978) typology. Following Ho and Pike (1998), we used a self typing method whereby senior professionals responded to our survey items designed to tap the fundamental distinctions between strategic types (Note that the instrument used by Ho and Pike was adopted from Haka's (1987)) The survey instrument composed five items to measure the strategic types of each firm based on Miles and Snow typology. We grouped the respondents into four groups based on the summed mean score for the items used to measure the Miles and Snow typology.

Performance: Although, many studies have found that different companies in different countries tend to emphasize on different performance measurement, the literature suggests financial profitability and growth to be the most common measures of organizational performance. This study used three financial performance measures namely Return on Assets (ROA), Return on Net Worth (RONW), and Sales growth, for the 5 year period (FY 2002-03 to FY 2006-07). The data were collected from the annual reports provided by CMIE, Prowess databases. Returns on assets (ROA) were calculated for each company using the formula: (EBIT divided by total assets) multiplied by 100 for each year. Then the results were totalled and divided by the number of years (five) to obtain the average value. The second measure of performance used by this study is Return on Net worth (RONW). Return on net worth was calculated for each company using the formula: (Net profit/loss divided by Net worth) multiplied by 100 for each year. Then the results were totalled and averaged as mentioned

above. These two ratios are used to represent the firm's profitability. The third measure of performance used is sales growth. Sales growth was calculated using the formula: (t year's sales minus the t-1 year's sales) divided by t-1 year's sales and then multiplied by 100. The results are totalled for each company and averaged as mentioned above. The average figure is used to represent sales growth for each firm.

Firm Size: This study used net fixed assets as firm size. Fixed assets for five years were totalled and divided by the number of years (five) to obtain the average value. The sample was divided into three groups. The average value of fixed assets with less than Rs.250 crores, labelled as a group 1, value between Rs.251 and Rs.500 crores, labelled as a group 2, and the value Rs.501 cores and above, labelled as a group 3.

Statistical Tools: Cluster analysis was done to classify the companies based on the strategy followed by them and discriminant analysis was done to confirm the groups of companies they belong to.

Further, to test the hypotheses, we employed two-way ANOVA and multiple regression with interaction term. This analysis examines whether firm's performance varies with its choice of business strategy and whether the firm size moderates the relationship between strategy and performance.

Result

Respondent characteristics: Most of the respondents were General Manager Finance (27.78 per cent), followed by Vice President –Finance (22.22 per cent), financial controllers (16.67 per cent), Senior Manager-Finance (16.67 per cent), CFOs (11.11 per cent), and Executive Director (5.56 per cent). This data has been presented in Table 1. Most of the respondents had an accounting and finance (ICWAI, CA, ACS etc) background/ qualification (92.30 per cent), while others had a background in arts, science and Management. Most of the respondents had held different positions and responsibilities during their career (92.30 per cent). Also they had experience in different industries and sectors as well (69.20 per cent).

Table 1: Distribution of Respondents – Job Title Wise

Job Title	Sample	
	Number	Per Cent
Chief Finance Officer (CFO)	2	11.11
General Manger –Finance	5	27.78
Vice President – Finance	4	22.22
Finance Controller	3	16.67
Manager – Finance	3	16.67
Executive Director	1	05.56
Total	18	100

Classification of Firm's Business Strategy: We employed cluster analysis to classify the companies into different strategy groups. Business strategic practices were classified into clusters by Hierarchical cluster analysis using Ward's method along with Squared Euclidean distance and thereby categorised into four groups. The clusters were labelled as follows:

▪ The group with the highest summed mean score was labelled as prospectors

▪ The group with the second highest summed mean score was labelled as analyzers

▪ The group with the third highest summed mean score was labelled as defenders

▪ The group with lowest summed mean score was categorised as reactors

Therefore, eighteen companies were categorised into four clusters. Table 2 exhibits the results of cluster analysis. Cluster 1 (5 companies) had the highest summed mean score of 22.4 and were labelled as Prospectors. Cluster 2 (5 companies) had the second highest summed mean score of 19 and were labelled as analysers. The cluster 3 (5 companies) had the least mean score of 15.2 and were categorised as reactors. The cluster 4 (3 companies) has the third highest summed mean score of 18 and were categorised as defenders.

Table 2: Cluster Analysis of Respondent Companies
(Based on types of Business Strategies)

Dimensions	Cluster 1 Prospectors		Cluster 2 Analysers		Cluster 3 Reactors		Cluster 4 Defenders	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Firm's Strategic priority is on long term rather short term profits	5.0	0.00	4.8	0.45	3.4	0.55	4.67	0.58
Firm concentrates on a single group of related products and sticks to it	5.0	0.00	4.4	0.55	3.6	1.14	1.33	0.58
Firm's growth has been realised mainly via new product development rather market penetration	4.8	0.45	2.8	0.84	2.4	1.14	4.00	1.00
Firms Strong emphasis is on research & development, technological leadership and innovation	4.4	1.34	4.8	0.45	2.6	1.14	5.00	0.00
Firm's preparedness to take a high risk if the potential returns are high	3.2	0.45	2.2	0.84	3.2	1.3	3.00	1.73
Total Summed Score	22.4		19		15.2		18	
No of Companies	5		5		5		3	

In order to confirm the above classification of firm strategies, we used discriminant analysis and the results are the same as given above i.e. the groups are classified correctly.

Performance: The average mean and standard deviations (SD) scores of the performance measures of the firms surveyed are presented in table 4.

Table 4: Descriptive Statistics of the average of Performance Measures

Performance Measures	Minimum	Maximum	Mean	Std. Deviation
SALES GROWTH	4.23	1279.40	90.4557	296.84142
RONW	5.40	51.19	25.4216	13.34283
ROA	14.27	94.94	31.1096	21.04759

Relationship between business strategy and performance: In order to examine the variation in the influence of business strategies and firm size on performance, we conducted the Two-way analysis of variance (ANOVA) i.e. whether firms using different business strategies (prospector, analyzer, defenders, and reactors) and firm size exhibit different performance (Return on Net Worth, Returns on Assets and Sales Growth). Table 5, shows the results of Two-way ANOVA between business strategies and firm size on performance measures namely RONW, ROA, and SG. The results revealed that the return on net worth of firms using different business strategies did not show any significant difference in terms of net worth F(3,9) = 0.853, p Ã 0.05. Similarly Firm size did not show any significant variance in term of return on net worth F (2,9) = 0.496, p Ã 0.05. The interaction of firm size and types of business strategy also show the similar results F (3, 9) = 0.497, p Ã 0.05. The test also exhibit similar results for Return on Assets i.e. no significant differences between firms using different strategies, firm size, and the interaction of firm size and business strategy types F (3, 9) = 0.93 p Ã 0.05 and F (2, 9) = 0.278, p Ã 0.05 F(3,9) = 0.241, p Ã 0.05 respectively. Conversely, the test exhibit different result for sales growth i.e. significant

differences between usage of business strategies, firm size, and the interaction of these two F (3, 9) = 3309 p Â 0.05 and F (2, 9) = 2342, p Â 0.05F(3,9) = 3370, p Â0.05 respectively.

In order to test hypothesis 2, we employed multiple regression with interaction term. This tool is used to yield a conservative estimate of the moderating effects of firm size on the performance and strategy relationship of automotive industry in India. The equation for the moderated regression model is as follows:

$$Y = b_0 + b_1 X + b_2 Z + b_3 XZ$$

Y = Dependent variable (i.e. RONW, ROA, and SG)

X = Independent Variable (i.e. Business Strategy)

Z = Moderator Variable (i.e. Firm size)

XZ = Interaction term

The purpose of the moderated analysis is to determine if we add the interaction term, it increases the explanation of variance (R^2) significantly. The results are given in table 6.

Table 5: Results of Two-way ANOVA between Business Strategies and Firm Size on Performance Measures

Performance Measures	Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Return on Assets	Corrected Model	4077.263	8	509.658	1.328	.339
	Intercept	16162.161	1	16162.161	42.116	.000
	CLU4_1	1070.486	3	356.829	.930	.465
	FANEW	1134.869	2	567.434	1.479	.278
	CLU4_1 * FANEW	1927.786	3	642.595	1.675	.241
	Error	3453.754	9	383.750		
	Total	24951.535	18			
	Corrected Total	7531.017	17			
Return on Net Worth	Corrected Model	1092.156	8	136.520	.635	.733
	Intercept	9187.961	1	9187.961	42.749	.000
	CLU4_1	549.918	3	183.306	.853	.499
	FANEW	213.294	2	106.647	.496	.625
	CLU4_1 * FANEW	320.197	3	106.732	.497	.694
	Error	1934.374	9	214.930		
	Total	14659.129	18			
	Corrected Total	3026.531	17			
Sales Growth	Corrected Model	1497150.59	8	187143.823	2101.423	.000
	Intercept	426488.805	1	426488.805	4789.008	.000
	CLU4_1	884321.305	3	294773.768	3309.991	.000
	FANEW	417288.084	2	208644.042	2342.847	.000
	CLU4_1 * FANEW	900518.808	3	300172.936	3370.617	.000
	Error	801.502	9	89.056		
	Total	1645232.184	18			
	Corrected Total	1497952.087	17			

Table 6: Firm Size as a moderator

Dependent Variable	Without Moderator (R^2)	Sg. F	With Moderator (R^2)	Sig. F
ROA	0.52	0.09	0.699	0.02
RONW	0.11	0.92	0.210	0.88
SG	0.19	0.77	0.200	0.90

The result shows that there exists change in the R^2 value of dependent variables with and without moderator. There is a statistically significant relationship (p Ã 0.05) among strategy, firm size and performance of automotive companies (measured in terms of ROA, RONW, and SG). But, consideration of firm size as a moderator results in change in R^2 compared to the case of analysis without moderator and the same has been significant except for ROA.

Discussion And Conclusions

This paper examined the relationship between business strategy and performance of Indian automotive industry. The result shows that there is no significant difference in the performance metrics (ROA and RONW) among the users of four business strategies and firm size. However, there exists significance difference in the performance metrics (SG). It shows that the findings are quite opposite of Namiki's (1989) and Parnell's (1997) findings. Further, respondents are classified into four groups with the help of cluster analysis and confirmed with help of discriminant analysis. Further, this study examines the role of firm size as a moderator on the performance and strategy relationship. There is a statistically significant relationship (p Ã 0.05) among strategy, firm size and performance of automotive companies (measured in terms of ROA, RONW, and SG). But, consideration of firm size as a moderator results in change in R^2 compared to the case of analysis without moderator and the same has been significant except for ROA.

This study may encourage the respondents to re-evaluate the strategy formulation process. Further they may encourage non-respondent companies to adopt the best strategy in order to improve their performance. We believe to be worthy of further investigation on the following: a. this study can be extended to make comparison among different industries on the relationship between business strategy and performance. b. Further studies can be carried over to identify the problems in formulation of business strategy c. Whether adopting different strategies show differences in the performance of the companies or not? –can be studied. e. Research can be carried over the role of environment, technology, firm size as a moderator on the relationship between business strategy and performance in automotive industry and the results can be compared with that of the other industries.

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