Measuring the effectiveness of managerial action in SMEs

An empirical analysis of management's response to industry competitive forces

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Abstract

Purpose – The paper's purpose is to investigate the direct and indirect effects of industry competitive forces on strategy-making and performance in small-to-medium-sized manufacturing companies.

Design/methodology/approach – The paper's approach is a survey design with structural equation modeling used for hypotheses testing.

Findings – The findings provide strong support for the mitigating role of managerial action through the strategy-making process and indications that this is true regardless of small-to-medium-sized enterprise (SME) size. Also, automotive-manufacturing SMEs seem to exhibit higher levels of competitive factors compared with non-automotive manufacturing SMEs.

Research limitations/implications – The major limitation of this research is that the survey was taken in the Mid-western USA and involved only SME manufacturing organizations. The research should be extended to other geographic regions, industry types, and larger organizations.

Practical implications – Many small company managers feel that they have little impact on industry-wide macro-economic and industry-specific forces. This research indicates that managers in SMEs can mitigate some of the negative effects of industry competitive factors through strategy-making activities.

Originality/value – This research is unique in several ways. It is the only research that has clearly identified and successfully measured the impact of managerial action in SMEs. It demonstrates that managerial action can be measured by comparing the direct and indirect effects of industry competitive forces on performance. It further identifies the need for a self-assessment tool to measure the effectiveness of managerial action of top managers in SMEs.

Keywords Small-to-medium-sized enterprises, Corporate strategy, Linear structure equation modelling, Competition advantage

Paper type Research paper

Introduction

For small-to-medium-sized manufacturing enterprises (SMEs), which are increasingly subjected to a globally competitive business environment, a timely response to the negative impacts of competition may be the difference in surviving tough times or going out of business.

The US manufacturing base as a whole and the US manufacturing base, in particular, have been engulfed in extreme global competition throughout the automotive industry. The impact of this competition has brought on the demise of many SMEs which have not been able to overcome the negative effects of global competitive forces. Yet there are successful, or surviving, organizations. What may have set them apart and made them, at least for now, able to withstand the fallout. By taking a closer look at the survivors there we can learn of the importance of effective managerial action in SMEs.

SMEs play a major role in the USA and the world's developing and industrialized economies. Studies verify the significant economic contribution made by SMEs. The

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United States Small Business Administration (USSBA) reports that over 50 per cent of employees and 45 per cent of payroll dollars in the USA are contributed by SMEs (USSBA, 2000). Although there has been a significant amount of research on SMEs (Peel and Bridge, 1998), empirical research has fallen short in considering the important economic contributions made by this group (Barnes, 2002; McCarthy and Leavy, 2000). In the manufacturing sector empirical research on SMEs is lacking. More specifically, there is a lack of empirical research specific to understanding the impacts of managerial action on performance and the degree to which smaller firms are affected by industry level factors.

This research addresses this shortfall in empirical research in several areas. First, this research provides a fresh look at the effectiveness of managerial action in SMEs and a model by which it can be assessed. Second it provides a comprehensive strategy-making construct which is tested and validated for use by other researchers. Finally, this research provides additional insight into the impacts of competitive forces on manufacturing SMEs engaged in global competition through the automotive industry. These contributions are made by testing a research framework that examines the relationships between industry-level competitive factors, strategy-making, and performance.

The model presented measures the performance impacts of managerial action through strategy-making using industry competitive forces as a baseline for performance. This approach provides a method in which organizational performance can be separated into two components; the impact of industry competitive forces and the mitigating actions of managers through strategy-making. To test the model, a survey of SME manufacturing companies was conducted in Ohio, Michigan, and Indiana in the USA.

Research background

The debate over how best to evaluate management performance has been the subject of academic discussion since Fayol's (1916) formulation of the five elements of management. While researchers have produced an extensive body of knowledge about management from numerous perspectives, there is still significant work to do, especially in smaller organizations. Despite their potential benefit, many of the popular approaches are not adaptable to SMEs or are simply not implementable because of resource constraints. Some researchers have expressed a high degree of satisfaction with some methods of assessment (Bernardin *et al.*, 1998) while others have argued for abolishing them altogether (Coens and Jenkins, 2000). We do not intend to reinforce or create a new such issues. We are suggesting that we need to look at some additional ways of assessing managerial action in smaller organizations. Furthermore, we are concentrating on only one aspect of management's role, that of managing and adapting to the external environment. Management's ability to transform the firm and adapt to a rapidly changing environment as described by Chakravarthy (1986) is the most important characteristic of performance. This may be especially true in SMEs since they typically are at the mercy of their larger customers and endure resource restrictions that can make an errant move fatal.

Assessing management is extremely important in all organizations but measuring it is very difficult and time-consuming, especially in resource scarce SMEs. This study is one of the early attempts to measure the effectiveness of managerial action in SMEs by measuring the direct and indirect effects of industry competition on managerial action and its impact on performance. This investigation is accomplished with

structural equation modeling techniques (SEM) which simultaneously evaluate all the relationships in the model and account for any related error among items.

Literature review

Two major streams of management research have focused on what managers do and what managers achieve. What managers do is a measure focused on the individual with performance measured on outcomes and focused on activities and behaviors. Performance is evaluated against some standard set of goals, meeting of objectives, actions or behaviors which are presumed to increase organizational performance (Kao and Hung, 2007; Toegel and Conger, 2003; Ghosh, 2005; Rajgopal *et al.*, 2002; Webb, 2004; Odiorne, 1987). The difficulty with these measures is that may or may not lead to enhanced organizational performance results. Action and behavior-based measures are difficult to apply in SMEs since SMEs typically do not have fully developed human resource functions capable of handling more sophisticated evaluation systems. Another problem is that top managers in SMEs are also typically the business owners with little, if any performance evaluation.

What managers achieve focuses more directly on performance results (outcome measure) (Woo and Willard, 1983; Cornell, 2003; Baker, 1987). This approach heavily relies on a robust and reliable outcome-based measure of organizational performance such as financial results. It also sends a simple message that it is organizational performance outcomes that matter, and individual manager performance only matters to the extent to which the organization as a whole benefits. This approach is typically taken with top executives in publicly traded companies while lower level managers are assessed based on multiple measures. We do not have to look very hard to find numerous examples of top executives who were fired for underperforming stock price and earnings expectations. While this approach seems crude, wondrously large organizations continue to find it appropriate to use with top managers. At some level this approach has historically been the most effective way to achieve desired results. While it is not used universally with all managers in large organizations, it is essentially universal with top managers. We propose that one possible answer is due to the first imperative of any organization survival.

This first imperative should also be true for SMEs and is in need of researcher attention. Thus, investigating an SME outcome measure that looks at performance of top management as a global outcome of the numerous actions and behaviors that constitute excellent management is required (Varadarajan and Ramanujam, 1990). A robust performance measure is needed. While no comparable measure of publicly traded financial reports exists for SMEs, we may be able to overcome some of this deficiency through model design. One such approach is proposed in this paper, a simple model that measures top management's ability to mediate successfully between a competitive external environment based on Porter's (1991) conception and the demands of the first imperative.

Perhaps the most universal conception of management is that of being "responsible" (Hales, 1999). One of the most important responsibilities of top management is to develop a strategic response to the competitive environment in which the company operates in such a way as to enhance overall performance (Ireland and Hitt, 1999). Since it is the "collective impact and interaction of scores of individual events and actions" (Ghoshal and Bartlett, 1994, p. 95) that produces this response, a global measure is in order.

The theoretical framework for measuring the effectiveness of managerial action is presented in Figure 1. The framework allows us to measure the direct and indirect effect of industry competitive forces on organizational performance and explore the relationship between three constructs of interest; industry competitive factors, strategy-making and performance.

In the following paragraphs we discuss the constructs in our framework including industry competitive factors, strategy-making, and performance.

Industry competitive factors

Classical industrial organization literature views firm conduct as constrained by industry forces (Bain, 1956; Mason, 1939). Porter modified the classical view by re-focusing on the firm rather than on industry performance, concluding that industry structure is partially influenced by firm activities (i.e. managerial choices) (Porter, 1980, 1985 and 1991). Porter's (1991) view of industry effects on the firm, known as the five-forces model, summarizes the challenges facing firms with regard to the competitive environment and structural artifacts of the industry.

Very little empirical research has been conducted using Porter's conceptualization because there was no developed and tested measure available. Recently, such a measure has become available (Spanos and Lioukas, 2001). In the SME environment, the intensely competitive context is well represented by Porter's conceptualization.

While Porter's conceptualization recognizes that firms can and do influence their industry, the primary impact on performance comes from the industry itself. Industry competitive forces directly and indirectly affect performance (Dess and Davis, 1984; Miller, 1988; Spanos and Lioukas, 2001; Liang *et al.*, 2007). The indirect impact of industry competitive forces is through strategy-making activities within the firm (Low and Cheng, 2006; Hayes and Upton, 1998; Leong *et al.*, 1990; Brown and Eisenhardt, 1999; Metts, 2004).

Strategy-making

Strategy-making has three multifaceted dimensions, rationality, interaction, and assertiveness (Miller, 1987). The rationality dimension is represented by two different schools of thought. The first school of thought is described as the synoptic (Fredrickson, 1984; Lindblom, 1959), planning (Mintzberg, 1973), or rational (Miller and Friesen, 1984) school. Characteristic of this school of thought is careful analysis, systematic scanning for problems and opportunities (Aguilar, 1967; Andrews, 1980), and planning of unified strategies. The second school of thought follows a bounded rationality model (March and Simon, 1958). This school of thought suggests that firms do little analysis and instead emphasize satisficing. In this approach, strategies are formulated by a disjointed process of intuition and spontaneity. This latter school is most appropriate to an organizational environment characterized by the informal processes present in many smaller SMEs in which strategy can be viewed as the

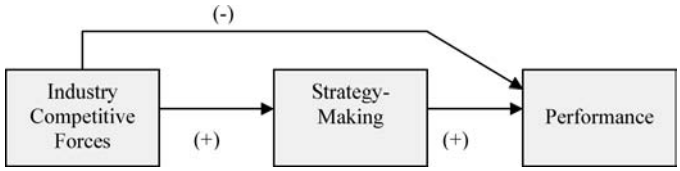


Figure 1.
Theoretical framework

consequence of an adaptive visionary approach resulting in an informal or realized strategy (Mintzberg, 1994).

The second dimension of strategy-making, *interaction*, involves bargaining, politicking, and consensus building in large, decentralized company decision-making processes. In smaller centralized firms, little interaction occurs as decisions due to the preponderance of single decision-makers (Collins and Moore, 1970). Although there may be little need for consensus building in small organizations which are characterized by little or no power sharing, it may be that interactions are motivated by the need for information. Information sources within organizational boundaries (internal factors) and outside the organization (external factors) are typically sought after (via informal environmental scanning) whether or not official power sharing is present.

The third dimension of strategy-making, *assertiveness*, refers to the accepted level of risk taking and the reactiveness or proactiveness of decisions. The particular level of assertiveness varies based on firm complexity (Quinn, 1980) and entrepreneurial presence (Mintzberg, 1973).

In an SME environment all of these dimensions of strategy-making are easily interpretable. *Rationality* is represented by the bounded rationality perspective in that the level of informal processes and spontaneity are high. *Interaction* is not so much with fellow decision-makers (typical in larger organizations) as it is with information resources such as the internal and external business environment. The level of *assertiveness* varies along individual preference dimensions and exhibits reactiveness or proactiveness modes of behavior based on a situational basis. The important connections between this view of strategy-making and our research model are reflected in the three dimensions of the strategy-making construct. We see environmental scanning activities (Beal, 2000) as the primary way in which information is informally collected and analyzed (*rationality dimension*), adaptive decision-making (Metts, 2006a, b) as the decision-making process (*interaction dimension*) and manufacturing strategy (Youndt, Snell, Dean, and Lepak, 1996) as representative of the level of risk taking (*assertiveness dimension*).

Performance

Performance improvement is at the heart of strategy research and for this reason most strategic theories either implicitly or explicitly underscore performance implications (Venkatraman and Ramanujam, 1986; Schendel and Hofer, 1979). The quality of the performance measures used in SME research is more problematic because of the lack of standardized accounting and reporting methods utilized and the variety of entity types (corporation, partnership, individual) used in smaller companies. The use of metrics such as return on equity (ROE) has questionable value in SME research because the equity portion of any small company balance sheet is often distorted by several factors present in smaller organizations. Some entity types common in SMEs do not even require the formulation or reporting of the balance sheet from which ROE is calculated. Two major drawbacks of accounting data are non-homogeneity and non-availability of data (Bracker and Pearson 1986). While some type of financial measures are necessary, the over reliance on financial measures is at best problematic in SME research (Murphy *et al.*, 1996). In this study we use perceptual information for performance evaluation, as described later.

Research model presentation and hypotheses development

The research model for measuring the effectiveness of managerial action is presented in Figure 2. The model allows us to measure the direct and indirect effect of industry competitive forces on organizational performance.

Hypothesis development

Some of the linkages of the research model have been confirmed by prior research efforts. Among these are the connection between industry competitive factors (industry forces) and performance (Porter, 1991; Dess and Davis, 1984; Miller, 1988; Spanos and Lioukas, 2001), environmental scanning dimension, manufacturing strategy dimension, and performance (Andrews, 1980; Miller, 1987; Bourgeois, 1995; Skinner, 1969; Anderson *et al.*, 1989; Hayes and Upton, 1998; Leong *et al.*, 1990; Brown and Eisenhardt, 1999; Metts, 2004). The linkage between industry competitive forces and strategy-making has not been covered directly in prior literature but a very similar relationship was found by Low and Cheng (2006). Based on the foregoing review and theoretical arguments, we propose four hypotheses in support of our research model.

H1. As the intensity of industry competitive forces increase, the level of strategy-making activities will increase.

Prior research has found that organizational information gathering activities increase as uncertainty increases (Auster and Choo, 1993; Low and Cheng, 2006). Industry competitive forces represent several unknowns involving competitors, suppliers, and threat of substitute products. It is reasonable to assume that firms would increase their strategy-making activities as the level of uncertainty and coercive pressure increases.

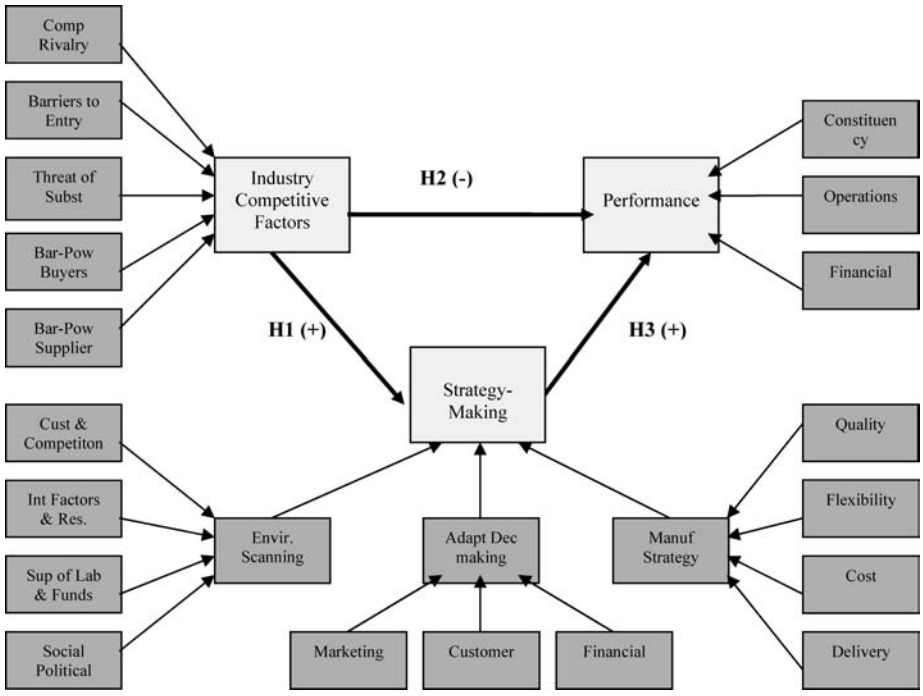


Figure 2.
Research model

For this reason we propose that the relationship between industry competitive forces and strategy-making will be positive.

H2. As the intensity of industry competitive forces increase, the level of organizational performance will decrease.

Given an increase in factors such as those represented by Porter's (1991) five-forces model we would expect a dampening impact on organizational performance. For example, as the bargaining power of customers increase, the organization is at a pricing disadvantage, therefore limiting profitability. Likewise, as the bargaining power of suppliers increases, the organization is at a cost disadvantage producing negative impacts on performance. In a similar way, increases in the threat of substitute products, lowering of barriers to entry, and increased levels of competition should adversely impact performance. Therefore, we propose that external factors will have a direct negative impact on performance.

H3. As the level of strategy-making activities increase, the level of organizational performance will increase.

As a firm becomes aware of deficiencies in the current strategy, brought on by industry competitive forces, an attempt will be made to correct them by making adjustments. Adjusting the current strategy to counteract the negative effects of industry competitive forces should lead to increased performance.

A fourth hypothesis related to the effectiveness of managerial action is proposed based on the direct and indirect impact of industry competitive forces. We hypothesize that effective managers will be able to overcome at least some of the negative impacts of industry competitive forces. The result of this effect, if true, would be that the indirect effect of industry competitive forces on performance would be positive while the direct effect would remain negative.

H4a. The direct effect of industry forces on performance will be negative.

H4b. The indirect effect of industry forces on performance will be positive.

We hypothesize that effective managerial action through strategy-making should at least partially counteract the negative effects of industry competitive factors. The ability of top managers to overcome these negative impacts is a global measure of the effectiveness of managerial action.

The constructs

Industry competitive forces

Measures for industry competitive forces were adopted from a scale developed by Spanos and Lioukas (2001), Dess and Davis (1984), and Miller (1988). Competitive rivalry is operationalized by four items consisting of product characteristics, promotional strategies, access to distribution channels, and service strategies to customers. Single item variables include barriers to entry, threat of substitute products, bargaining power of suppliers, and bargaining power of buyers. Spanos and Lioukas (2001) reported Cronbach's alpha of 0.83 and measurement model fit statistics for the competitive rivalry construct including a χ^2 (2) of 7.278, p value of 0.026, a CFI of 0.968, and robust CFI value of 0.995.

Strategy-making

Strategy-making is conceived of as a second-order construct with first order constructs including environmental scanning, adaptive decision-making, and manufacturing strategy. The dimensions of environmental scanning include customers and competitors, internal factors and resources, supply of labor and funds, and social/political (Beal, 2000). These variables represent the scope of environmental scanning activities and are measured on a five-point Likert scale (see Appendix 1 for individual items).

Adaptive decision-making is defined as "a conscious or unconscious tendency to place a high priority on adaptation to ones environment throughout the decision making process" Metts (2004, 2006a, b). It is based on an attempt by decision-makers to adapt the limited resources of the firm to its environment in such a way as to maximize profitability. The core of organizational adaptation is the decision-making process (Sharfman and Dean, 1997). In an SME environment the decision-maker is often the CEO who is also the chief strategist. The adaptive decision-making variables include financial, customer, and market/pricing adaptation. Financial adaptation in SMEs arises from resource scarcity. Customer adaptation arises from the low bargaining power position of manufacturing SMEs in that they are typically serving much larger customers who wield significant influence over them consequently influencing strategic choices. Finally market/pricing adaptation in SMEs arises from their inability to influence the market because of their smaller size. Adaptive decision-making is an eight item scale and was developed on a sample of SMEs (the items for adaptive decision-making are listed in Appendix 1).

Manufacturing strategy is operationalized on four manufacturing strategic imperatives including cost, quality, flexibility, and delivery (Youndt *et al.*, 1996). These variables are consistent with those found throughout literature (Leong *et al.*, 1990; Marucheck *et al.*, 1990; Schroeder *et al.*, 1986; Skinner, 1969; Upton, 1995; Wheelwright, 1981). Manufacturing strategy is a 13 item scale.

Performance

Organizational theorists have measured organizational effectiveness using three different approaches. The goal-based approach (Etzioni, 1964), the systems approach (Georgopolous and Tannenbaum, 1957; Yuchtman and Seashore, 1967; Steers, 1975), and the constituency approach (Thompson, 1967; Pfeffer and Salancik, 1978; Connolly *et al.*, 1980; Zammuto, 1984).

Using Venkatraman and Ramanujam (1986) and Metts (2006a, b) our construct includes financial performance, operational performance, and organizational effectiveness (constituency or stakeholder performance level) as dimensions of the organizational performance domain. The construct consists of ten items covering the three dimensions (see Appendix 1).

The survey

The potential respondents to the large-scale survey included SME manufacturing companies, defined by the USSBA as firms with less than 500 employees. A total of 3,965 surveys were mailed to manufacturing SMEs in the Mid-western USA (Ohio, Michigan, and Indiana), of which 547 responses were obtained for a response rate of 13.74 per cent. Table I provides a breakdown by state.

A variety of manufacturer's responded to the survey including companies involved in the manufacturer of automotive or recreational vehicle parts, specialty products, tool

and die, food, wood, and furniture. Over 62 per cent (62.8 per cent) of the respondents were engaged in automotive manufacturing-related businesses. A total of 94.5 per cent were CEOs or top managers and 70.1 per cent represented family businesses. A total of 92 per cent of respondents had less than 250 employees ($\leq$250) and only 6.8 per cent had ten or fewer. A total of 80.0 per cent of respondents had an ownership stake with 43.6 per cent having majority ownership. Most of the response group had significant experience in their field with 81.2 per cent having greater than ten years, 51.9 per cent having greater than 20 years, and 20.7 per cent having greater than 30 years. A total of 88.3 per cent of respondents were over the age of 40 and 24.2 per cent over the age of 60. The education level of respondents indicated that 81.6 per cent had some college, 49.4 per cent having a four year degree, and 23.6 per cent having a graduate degree. Average annual sales greater the one million (US$) was reported by 91.1 per cent of respondents with 34.8 per cent reporting greater than ten million (US$).

The data set was analyzed for missing data patterns, maximum and minimum response values, and excluded case percentages for each survey item. Before any analysis was done a random sample of 27 (5 per cent sample) surveys were selected and audited for data entry errors with none found. The missing data are considered to be random since no patterns were detected. Mean substitution was used to replace missing data in all subsequent analysis.

To satisfy the assumptions of the multivariate procedures used for confirmatory analysis and model testing, we evaluated the linearity and normality of the data prior to mean substitution. Scatter plots were utilized to evaluate linearity and histograms and normal *Q-Q* plots were used to evaluate univariate normality. Based on these evaluations, the data are considered linear and univariate normal. For analysis purposes we believe the data approximates multivariate normality (Koziol, 1993).

The 547 responses from the large-scale survey were split (based on random selection) into two data sets for analysis purposes. The first set ($n = 273$) was utilized for exploratory analysis of the strategy-making construct and confirmatory analysis of the measurement scales. The second-half ($n = 274$) was utilized for model testing.

Confirmation of scales

SEM was used for exploratory and confirmatory factor analysis to test the unidimensionality of each construct. All SEM analysis was conducted using AMOS 4.0 SEM software (Arbuckle, 1999). Each scale was evaluated for reliability and corrected-item to total correlations (CITC) to make sure that items contributed to the dimensions of each construct (Churchill, 1979).

Table II presents the corrected item to total correlations of all items and the reliability of all first and second-order variables used in the analysis. The table is categorized by construct, variable, and items to show the CITC, reliability, and alpha values for each variable. Reliability was assessed using Cronbach's alpha (Nunnally, 1978). Values around 0.70 are typically considered adequate to conclude internal

Table I.
Survey response by state

State	Valid responses (%)	Response rate (%)	Percentage of total (%)
Michigan	171	11.64	31.3
Indiana	198	21.24	36.2
Ohio	178	11.51	32.5
Total	547	13.74	100.0

Construct	Variables	Items	CITC	Reliability	Alpha if item deleted
Industry competitive forces	Competitive rivalry	Efcr1	0.5978	$\alpha = 0.7678$	0.6968
		Efcr2	0.5499		0.7230
		Efcr3	0.5450		0.7246
		Efcr4	0.5811		0.7056
Strategy-making/ environmental scanning dimension	Customers and competitors	Escc1	0.6123	$\alpha = 0.8516$	0.8342
		Escc2	0.7998		0.7819
		Escc3	0.6853		0.8153
		Escc4	0.7181		0.8069
		Escc6	0.5065		*0.8579*
	Internal factors and resources	Esifr1	0.6560	$\alpha = 0.8112$	0.7468
		Esifr2	0.6547		0.7560
		Esifr3	0.6831		0.7229
	Supply of labor and funds	Esslf1	0.4141	$\alpha = 0.6030$	0.5152
		Esslf2	0.5171		0.3750
		Esslf3	0.3315		*0.6118*
	Social/political	Essp1	0.7687	$\alpha = 0.8735$	0.8109
		Essp2	0.8232		0.7603
		Essp3	0.6837		*0.8851*
Strategy-making/ adaptive decision-making dimension	Financial adaptation	Adpt6	0.7978	$\alpha = 0.8867$	0.8232
		Adpt7	0.8530		0.7774
		Adpt8	0.6979		*0.9167*
	Customer adaptation	Adpt3	0.4567	$\alpha = 0.6259$	N/a
		Adpt4	0.4567		N/a
	Market/pricing adaptation	Adpt1	0.5241	$\alpha = 0.6181$	0.3634
		Adpt2	0.4340		0.5270
		Adpt5	0.3499		*0.6335*
Strategy-making/ manufacturing strategy dimension	Quality	Msqlty1	0.5163	$\alpha = 0.8203$	*0.8451*
		Msqlty3	0.6665		0.7639
		Msqlty4	0.7443		0.7295
		Msqlty5	0.6811		0.7576
	Cost	Mscost1	0.3312	$\alpha = 0.7436$	*0.8052*
		Mscost2	0.6049		0.6444
		Mscost3	0.7090		0.5847
		Mscost4	0.5522		0.6810
	Delivery	Msdel1	0.6366	$\alpha = 0.7757$	N/a
		Msdel2	0.6366		N/a
	Flexibility	Msflex1	0.5783	$\alpha = 0.7457$	0.6544
		Msflex2	0.6322		0.5880
		Msflex3	0.5169		0.7240
Performance	Operational performance	P2op2	0.5123	$\alpha = 0.7319$	0.6776
		P2op3	0.6186		0.6108
		P2op4	0.4183		*0.7333*
		P2or1	0.5649		0.6566
	Financial performance	P2fina	0.7344	$\alpha = 0.8329$	0.7268
		P2fins	0.5746		*0.8774*
		P2finp	0.7808		0.6771
	Constituency performance	P2or2	0.5766	$\alpha = 0.7544$	0.6956
		P2or3	0.6737		0.5650
		P2or4	0.5345		0.7261

Table II.
Reliability analysis of all variables

consistency. The alpha values of all variables for all constructs show good reliability with all items contributing to alpha. The few exceptions (shown in "bold" print in the table) are considered minor in magnitude and were therefore not dropped from further analysis. For brevity the items were coded in the table. A full text listing of all items is provided for in Appendix 1.

Exploratory analysis of the second-order strategy-making construct was conducted using the first data set. All three of the first-order constructs included in the second-order model (manufacturing strategy, environmental scanning, and adaptive decision-making) have been confirmed in prior literature. In order to validate the existence of a single, second-order construct (SEM alone does not explicitly reveal or provide evidence of a second-order construct) we used the T-coefficient as reported by Doll *et al.* (1995). A T-coefficient greater than 0.80 indicates the existence of a single second-order construct. The T-coefficient is calculated to be greater than 0.99. We can conclude that there is justification for the single, second-order construct (strategy-making).

The regression coefficients for environmental scanning, adaptive decision-making, and manufacturing strategy were 0.747 ($t = 5.810$), 0.865 ($t = 6.028$), and 0.785 ($t = 5.847$), respectively. Model fit indexes were GFI = 0.930, AGFI = 0.888, RMR = 0.035, and TLI = 0.889 indicating good fit to the data.

The industry competitive factors, four-item construct for competitive rivalry showed excellent reliability ($\alpha = 0.7678$) with all items contributing (see Table I). The single item measures for industry competitive factors scale were tested for divergent validity using Pearson correlations with no significant correlations found (see Table III).

Table IV summarizes the results of confirmatory factor analysis for all constructs used in the research model. As indicated, the model fit is good to excellent for all constructs (see Joreskog and Sorbom, 1989).

All confirmatory factor analysis models are included in Appendix 2. The standardized regression weight for the competitive rivalry variable of the industry competitive factors construct was 0.960. The standardized regression weights for the strategy-making variables were 0.842 for the environmental scanning variable, 0.762

Table III.
Correlations of single item measures

Items	Threat of substitutes	Barg-Pow buyers	Barg-Pow suppliers	Barriers to entry
Threat of substitutes	1.000			
Barg-Pow buyers	0.105	1.000		
Barg-Pow suppliers	0.010	−0.029	1.000	
Barriers to entry	−0.129	0.049	0.134	1.000

Table IV.
Model fit indexes for confirmed scales

Model	GFI	AGFI	RMR	TLI
Industry competitive forces	0.984	0.970	0.033	1.004
Strategy-making	0.922	0.874	0.034	0.838
Performance	0.937	0.892	0.039	0.905

for the adaptive decision-making variable, and 0.872 for the manufacturing strategy variable. The standardized regression weights for the performance construct were 0.401 for the financial performance variable, 0.355 for the operational performance variable, and 1.510 for the stakeholder performance variable.

Structural model testing

There are three variables in the research framework. There is one exogenous variable – industry competitive forces (ICF) – ξ_1, and two endogenous variables including strategy-making (SM) – η_1, and performance (P) – η_2. Given the structural model form:

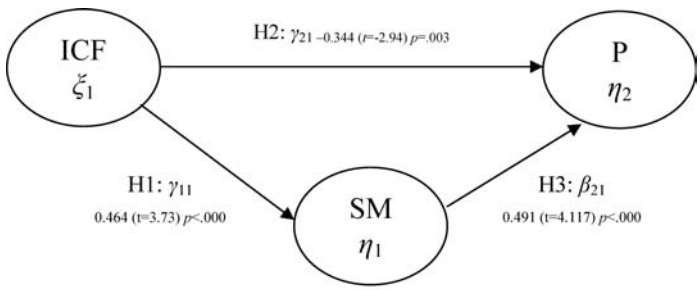
$$\eta = \beta\eta + \Gamma\xi + \zeta$$

The three hypotheses represent the causal relationships in the structural model. *H1* is represented in Figure 3 by the relationship γ_{11} (ICF → SM), *H2* is represented by the relationship γ_{21} (ICF → P), and *H3* is represented by the relationship β_{21} (SM → P). These causal paths of our hypothesized relationships are represented by the following structural equations:

$$\begin{array}{ll} H1 \text{ is estimated by} & \eta_1 = \gamma_{11}\xi_1 + \zeta_1 \\ H2 \text{ and } H3 \text{ are estimated by} & \eta_2 = \gamma_{21}\xi_1 + \beta_{21}\eta_1 + \zeta_2 \end{array}$$

Model fit was assessed using GFI (0.886), AGFI (0.852), RMR (0.044), and p value of the default model (0.000) indicating good model fit to the data (Joreskog and Sorbom, 1989). The results of hypotheses testing of the research framework using SEM are presented in Figure 3. As indicated *H1*, *H2*, and *H3* are supported. The standardized regression weights, t-values, and p-values for the various hypotheses are shown in the figure.

To evaluate the results of testing *H4a* and *H4b* we looked at the direct and indirect effect of industry competitive forces on performance. The standardized indirect effect of industry competitive forces on performance is calculated by multiplying the intervening regression weights of ICF → SM (0.464) and SM → P (0.491) yielding an indirect effect of +0.228. The total effect of industry competitive forces on performance is the sum of the direct negative effect (−0.344) plus the indirect effect (+0.228) resulting in a total effect of −0.116. Thus, the total negative effect of industry



Where: ICF: Industry Competitive Factors construct
SM: Strategy-making construct
P: Performance construct

Figure 3.
Structural model presentation

competitive forces was partially over-come by the positive indirect effect through strategy-making activities. This supports *H4a* and *H4b* that the negative affects of industry competitive forces is mitigated by managerial action through the strategy-making. The fact that the total effect remains negative (−0.116) indicates that managers were only partially successful in their efforts to overcome the negative effects of industry competitive forces.

Discussions

The support of our hypotheses provides some answers to our questions regarding the effectiveness of managerial action in SMEs. We can conclude that the strategy-making efforts of managers do make a difference in reducing the negative impacts of industry competitive forces. According to our test results we can clearly identify the positive effects of managerial response captured in the indirect effect of industry competitive forces on performance. This confirms that the efforts of managers do make a difference by developing a strategic response to various industry-level competitive forces.

Our second conclusion is that industry competitive forces do negatively impact performance and managers can only partially overcome these negative effects. The negative impact of industry competitive factors is clearly demonstrated in the structural model testing by the strength and significance of the regression weight. However, these forces are only partially mitigated by the managerial response as indicated by the total effect (−0.116). Because the total effect remains negative, it indicates managers are unable to completely neutralize the negative impacts of industry competitive factors.

Our final major conclusion is that managers are able to neutralize most of the negative effects of industry competitive forces to the extent that they can manage around them. In other words, there are certain aspects of industry competitive forces that do not lend themselves to effective managerial response. An example would be the effect of rivalry among competitors resulting in cost cutting throughout an industry. While managers may respond to price reductions with internal cost cutting and re-structuring there is no guarantee that the response will escape a net drop in performance as shown by the model.

After the initial analysis, additional model testing was conducted to explore the effects of automotive vs non-automotive manufacturing to determine if the findings were more or less applicable to a subset of the data. The data were coded by type of manufacturing and model testing was re-run (see Table V).

The results indicated that the model did change significantly. The size of the coefficients was stronger for the ICF → P (industry competitive factors to performance link) and the ICF → SM (industry competitive factors to strategy-making link). This analysis demonstrates the differences in the competitive conditions among automotive manufacturers in the Mid-western USA when compared to other manufacturers. This difference was also evident in the direct and indirect effects of industry competitive

Table V.
Comparison of automotive and non-automotive manufacturing SMEs

	n	ICF → P	ICF → SM	SM → P	Dir effect of ICP → P	InDir effect of ICP → P	Tot effect of ICP → P
Automotive	172	−0.455	+0.687	+0.532	−0.455	+0.366	−0.123
Non-automotive	102	−0.239	+0.192	+0.567	−0.239	+0.109	−0.130
Base Mod	274	−0.344	+0.464	+0.491	−0.344	+0.228	−0.116

factors on performance. There is a very large difference in the direct (−0.455 vs −0.239) and indirect effects (+0.366 vs +0.109). Given that the total effect (−0.123 vs −0.130) was similar, we conclude that managers in automotive manufacturing SMEs are feeling more intense levels of competition, but are also mounting a more intense response. This finding seems to indicate that managers under more pressure will more actively seek out strategic solutions in an effort to reduce the negative impact on performance. By contrast, when managers are under less pressure, they will not seek strategic solutions as aggressively.

A second issue is whether or not the size of the SME had any impact on the relationships in the model was also investigated. To evaluate this issue we used the number of employees as a proxy for organizational size and re-ran the model for various size groups. We tested two additional sub-groups from our data set including SMEs with less than of equal to 250 employees (≤250) and a smaller group consisting of less than or equal to fifty employees (≤50). The results are shown in Table VI and are compared to the baseline original model. We found that the coefficient sizes were approximately the same and the relationships were in the same direction. In other words, the model seems robust for various sizes of SMEs based on number of employees.

Practical implications

Many small company managers feel they have little impact on industry-wide macro-economic and industry-specific forces. In addition, and perhaps even more serious, is a feeling of powerlessness with regard to their ability to mount an effective response. This issue is not surprising given that SMEs spend most of their time adjusting to a rigorously competitive business environment where they struggle to survive. SMEs typically have no power over their larger counterparts who are often both their suppliers and their customers. They also suffer from an extremely high failure rate in the USA and abroad with 34 per cent failing in the first year and 60.5 per cent failing by the sixth year (Headd, 2003). The international failure rates are not much better (Watson and Everett, 1996). About 90 per cent (88.7 per cent) of all business failures is due to management mistakes (Lewis, 2006). We believe that our sample of manufacturing SMEs which have survived the onslaught of global competition demonstrate the value of good management. As indicated by the results of this research, managers in SMEs can mitigate some of the negative effects of industry competitive factors through effective managerial action through strategy-making activities.

Limitations and future research

This research is limited in several ways. First, the sample was from the Mid-western region of the USA and may not be representative of other regions within the USA or of other regions of the world. Second, we focused on manufacturing enterprises, so the findings may or may not prove meaningful for service industry SMEs.

Table VI. Comparison of model testing with different number of employees

	n	ICF → P	ICF → SM	SM → P	Dir effect of ICP → P	InDir effect of ICP → P	Tot effect of ICP → P
≤50	136	−0.321	+0.316	+0.391	−0.321	+0.198	−0.123
≤250	243	−0.276	+0.383	+0.451	−0.276	+0.173	−0.103
Base Mod	274	−0.344	+0.464	+0.491	−0.344	+0.228	−0.116

Future research needs to confirm or disavow the generalizability of these findings to a larger SME population. Future research should also concentrate on the development of a self-assessment tool for use in SMEs to measure the effectiveness of managerial action among owner-managers. This group typically receives no meaningful feedback from within their own companies except the inevitable bottom-line performance. An assessment tool that measures the effectiveness of managerial action by comparing the direct and indirect impact of industry competitive factors would be valuable to SMEs.

Conclusion

This research makes contributions to the existing body of literature concerning the mediating role of managers, strategy-making and performance in SMEs. The mediating effect of managerial action through strategy-making was modeled empirically to show the benefits of managerial action on performance. While this confirms prior theory related to the effects of industry competition on firm performance, it extends our understanding of the mediating effects of managerial action on performance in SMEs. It also provides an example of a global measurement for managerial action in SMEs and a simple way to model it.

In addition this research contributes a new measurement scale for strategy-making in SMEs. The new construct consists of 39 items and three variables including manufacturing strategy, environmental scanning, and adaptive decision-making. The new scale was explored and confirmed in this study making it ready for use by other researchers.

The importance of managerial action is highlighted by the finding that the negative impact of industry competition is somewhat negated by strategy-making activities within SMEs, a process driven by top management. This confirms prior research that there is a systematic and unsystematic component to firm performance in SMEs; one driven by industry competitive factors (Porter, 1980) and the other by managerial action through strategy-making. What this means for smaller organizations is that there is a direct, measurable benefit to effective strategy-making activities. Also, the ultimate performance outcome in a competitive environment is largely determined by the effectiveness of managerial action taken as a global measure of the ability of a manager (or managers) to counteract the negative impacts of industry competitive factors. In the case of SMEs, which are often constrained geographically and exposed to high levels of competition, the ability of managers to engage in effective managerial action through strategy-making may quickly determine whether or not the firm survives. Finally, global measures may be the only realistic alternative for assessing the effectiveness of managerial action in resource scarce SMEs, since the practical application of more traditional methods are not implementable.

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Appendix 1. Survey items

Table AI.
Industry competitive factors

Code	Item How would you evaluate the intensity of competition your firm is facing in the following areas with respect to . . .
Efcr1	Product characteristics
Efcr2	Promotional strategies among competitors
Efcr3	Access to distribution channels
Efcr4	Service strategies to customers
	Individually scored Items How would you evaluate the. . .
Efif1a	Barriers to entry
Efif2	Threat of substitute products
Efif3	Bargaining power of buyers
Efif4	Bargaining power of suppliers

Code	Item Please indicate the degree to which your firm seeks out (by a formal or informal information collection system) the following typed of information about its operating environment...
Escc1	Competitors prices
Escc2	Competitor's introduction of new products
Escc3	Competitor's advertising/promotion programs
Escc4	New product characteristics
Escc5	Customer'sbuying habits
Escc6	Customer'sproduct preferences
Escc7	Customer's demands and desires
Esifr1	Your company's sales capabilities and resources
Esifr2	Your company's financial capabilities and resources
Esifr3	Your company's management capabilities and resources
Esslf1	Availability of external financing
Esslf2	Availability of labor
Esslf3	New manufacturing technologies
Essp1	Local/national/global social conditions
Essp2	Local/national/global political conditions
Essp3	Local/national/global economic conditions

Table AII.
Environmental scanning dimension of strategy-making

Code	Item Indicate the degree of emphasis which your manufacturing plant places on the following activities...
Msflex1	Lead-time reduction
Msflex2	Set-up time reduction
Msflex3	Ability to change priorities of jobs on the shop floor
Msflex4	Ability to change machine assignments on the shop floor
Msqlty1	Statistical process control
Msqlty2	Real-time process control
Msqlty3	Updating process equipment
Msqlty4	Developing new processes for new production programs
Msqlty5	Developing new processes for old production programs
Msdel1	Provide fast deliveries
Msdel2	Meet delivery promises
Mscost1	Reduce inventory
Mscost2	Increase capacity utilization
Mscost3	Increase equipment utilization
Mscost4	Reduce production costs

Table AIII.
Manufacturing strategy dimension of strategy-making

Code	Item Indicate the degree of emphasis which your manufacturing plant places on the following activities/priorities...
ADPT1	Adapt to competitor pricing
ADPT2	Adapt to market forces in industry
ADPT3	Adapt our resources to customer needs and preferences
ADPT4	Adapt our capabilities to the current business environment
ADPT5	Adapt our product pricing to our suppliers pricing
ADPT6	Adapt to restraints of our cash flow
ADPT7	Adapt to restraints of capital availability
ADPT8	Adapt to debt holder's (i.e. bank's) requirements

Table AIV.
Adaptive decision-making dimension of strategy-making

Code	Item For each of the following measures please indicate how you believe your firm performs in comparison to your competitors
P2fina	Average return on assets over the last three years
P2fins	Average per cent change in sales over the last three years
P2finp	Average before tax profit over the last three years
P2op2	Quality of product (meets customer specification)
P2op3	On-time delivery performance
P2op4	Your ability to quickly change production volumes
P2or1	Customer satisfaction
P2or2	Employee satisfaction
P2or3	Ownership satisfaction
P2or4	Your bank or financial institution satisfaction

Table AV.
Performance

Appendix 2

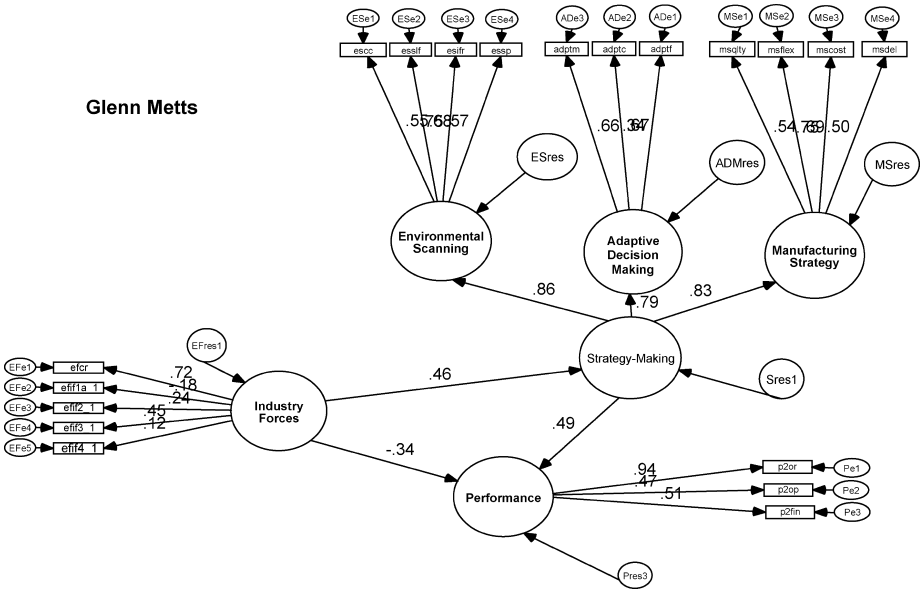

Figure A1.
Managerial action structural model

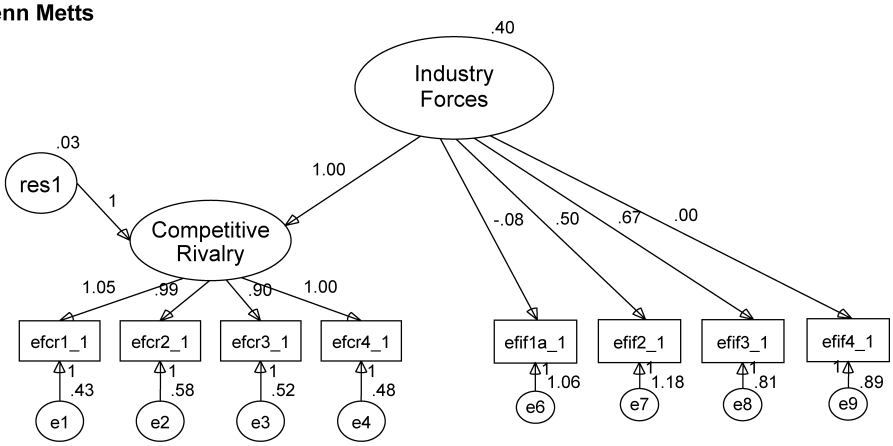

Figure A2.
Industry forces construct

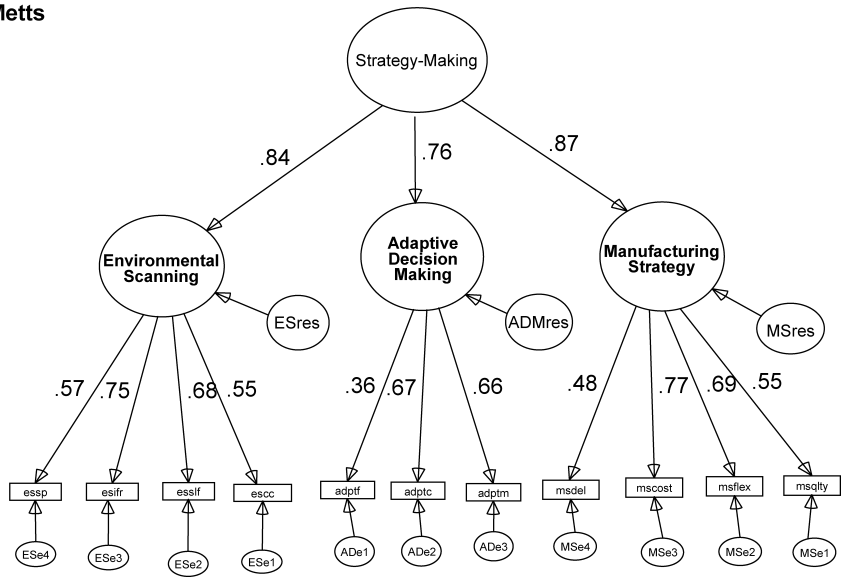

Figure A3.
Strategy-making construct: second order model

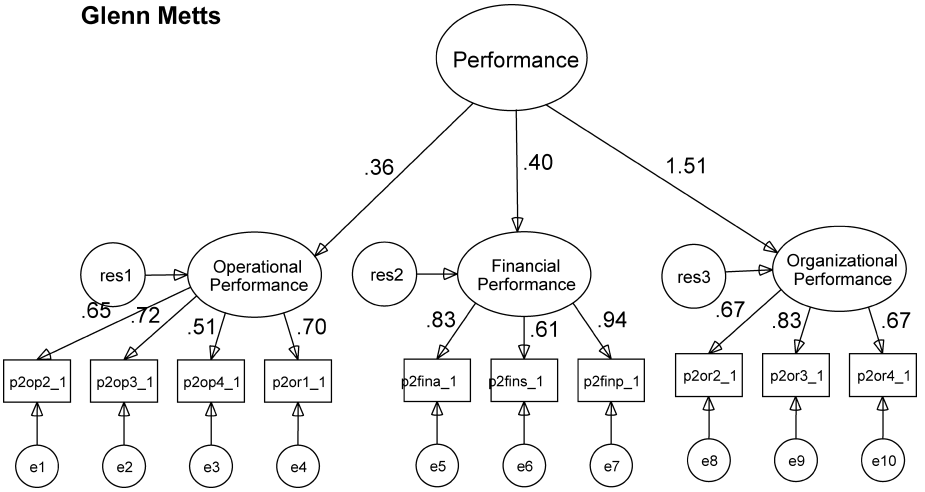

Figure A4.
Performance construct

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Glenn A. Metts is an Assistant Professor of Management at Indiana Purdue Fort Wayne. He received his MBA in Operations Management and his PhD in Manufacturing Management and Engineering from the University of Toledo. Prior to joining academic ranks he founded seven businesses representing such diverse fields as accounting and consulting, automotive component manufacturing, and HVAC contracting. He is also a certified public accountant and maintains an active license to practice. He has two patents in the automotive field in fuel systems manufacturing. His research has appeared in *Small Business Process Management Journal* and several conference proceedings. His research interest includes small business management, production operations, and strategy. Glenn A. Metts can be contacted at: gmetts@ameritech.net