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ORIGINAL EMPIRICAL RESEARCH

Capabilities and financial performance: the moderating effect of strategic type

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Abstract The Miles–Snow (M–S) strategic typology has continued to receive attention in the academic business press, even though it has been criticized for not making explicit the relationships between strategic type and ultimate profit performance. Using the market orientation and Resource-Based View literature, we develop hypotheses regarding relationships between M–S strategic type and four firm capabilities (technology, information technology, market-linking, and marketing capabilities), relationship between the four capabilities and performance, and the moderating role of M–S strategic type. An empirical test involves multiple data collections from 216 firms. The study results suggest that there are significant relationships between capabilities and performance if one does not account for the moderating role of strategic type. When strategic type is used as a moderating variable, we find that only certain capabilities had significant effects on profitability. For example, technology and information technology capabilities increase financial performance for prospector organizations, while a different set of capabilities (market-linking and marketing) are positively related to financial performance for defender organizations. We discuss how our findings are consistent with the expectations of the Resource-Based View of the firm. We conclude with a discussion of theoretical and managerial implications.

Keywords Market orientation · Strategic type · Firm capabilities · Miles–Snow typology · Resource-based view

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Introduction

The Miles–Snow strategic typology (1978) (hereafter M–S) has received much attention in the marketing and management literature over the last two decades (e.g., Conant, Mokwa, & Varadarajan, 1990; Ruekert & Walker, 1987; Walker, Boyd, Mullins, & Larréché, 2003; DeSarbo, Di Benedetto, Song, & Sinha, 2005; DeSarbo, Di Benedetto, Jedidi, & Song, 2006). M–S envisions strategy as the patterns in the decisions by which a strategic business unit (SBU) aligns itself with its environment, and they categorize organizations according to these patterns. In their classic empirical study, M–S (1978) propose four strategic types—prospectors, analyzers, defenders, and reactors—and suggest that the first three types will choose a different strategy with respect to products and/or markets. Prospectors will innovate technologically and seek out new markets, analyzers will prefer a "second-but-better" strategy, and defenders will focus on maintaining a secure niche in a relatively stable product or service area. They argue that all three types can be successful if the SBU matches its strategy to the competitive environment and develops and deploys appropriate capabilities.

Capabilities have been broadly defined as "complex bundles of skills and accumulated knowledge that enable firms [or SBUs] to coordinate activities and make use of their assets" (Day, 1990, p. 38). Day (1994, p. 40) suggest

that "it is not possible to enumerate all possible capabilities, because every business develops its own configuration of capabilities that is rooted in the realities of its competitive market, past commitments, and anticipated requirements." In this article, we focus on four important firm capabilities: technology, information technology (IT), market-linking, and marketing capabilities (see Day, 1994; Conant et al., 1990; DeSarbo et al., 2006). Previous work has also shown that the relationship between strategic type and financial performance is moderated by variables such as environmental variability (McKee, Varadarajan, & Pride, 1989). With the exception of marketing capabilities (see Conant et al., 1990), the interrelationships among strategic type, organizational capabilities, and financial performance have not yet been examined.

Our research objective is to examine the nature of the relationship between capabilities and financial performance. We will examine the relationship between an SBU's strategic type and four distinct capabilities (i.e., technology, IT, market-linking, and marketing), the relationship between the four capabilities and financial performance (capability–performance relationship), and the moderating role of strategic type on the capability–performance relationship. According to the Resource-Based View (RBV) of the firm, some types of capabilities will be more closely related to superior performance than others, depending on the SBU's strategic type. Previous empirical studies have not subdivided their samples by strategic type, thus differences across strategic types may have been obscured. To our knowledge, this is the first empirical study that has sought to examine whether strategic type moderates the capability–performance relationship, which would be consistent with the RBV. This study also makes the contribution of investigating relationships among all organizational capabilities (IT, technology, and market-linking in addition to marketing), strategic type, and financial performance.

This article is organized as follows. Drawing on market orientation and the RBV literature, we propose a set of hypotheses relating an SBU's relative capabilities to its selection of strategic type and its financial performance. We then describe our research design and data collection processes, and present our empirical results. We conclude by noting theoretical implications and some possible prescriptions for managers who want to improve their SBU or organization's strategy selection.

Research hypotheses

The Miles–Snow strategic typology

M–S (1978) classify organizations as prospectors, analyzers, defenders, and reactors. The strategic types differ in the rate at which they change products or markets in response to environmental change (Walker et al., 2003). Though it has occasionally been challenged or criticized (see, e.g., Hambrick, 1983), the M–S typology is still widely viewed in strategic management and marketing as a valid way to analyze SBU-level strategy development (Conant et al., 1990; DeSarbo et al., 2005, 2006; Hambrick, 1983, 2003; McDaniel & Kolari, 1987; Ruekert & Walker, 1987; Walker et al., 2003).

According to M–S (1978), a prospector's strategy is to lead changes in its industry. Prospectors typically operate within a broad product-market domain that undergoes periodic redefinition (Conant et al., 1990). They value being the first in new products and market areas, even if these efforts are not always highly profitable (Robinson, Fornell, & Sullivan, 1992). They compete principally by identifying latent customer needs, responding rapidly to early signals of environmental change and emerging opportunity to meet new marketplace opportunities and launch new products that satisfy these latent needs. This has been defined as having a proactive market orientation (Maltz & Kohli, 1996; Narver & Slater, 1990; Narver, Slater, & MacLachlan, 2004; Slater & Narver, 1995, 2000). Consequently, prospectors devote significant resources to new product development, market research, and other marketing expenses (Hambrick, 1983; Shortell & Zajac, 1990; Walker et al., 2003). Prospectors also rely on close ties with the channel of distribution to anticipate latent needs as well as environmental changes (Walker et al., 2003).

A defender firm's strategy is to attempt to locate and maintain a secure niche in a relatively stable product or service area. Defenders are more risk averse than prospectors. Typically, they do not look outside well-defined product-market domains for new opportunities (Shortell & Zajac, 1990). As compared to prospectors, defenders more typically exhibit a reactive market orientation (Narver & Slater, 1990). Rather than seeking to satisfy customers' latent needs, which requires investment in new product or market development, defenders compete principally by continuously satisfying customers' manifest, or expressed, needs (Narver et al., 2004; Slater & Narver, 1995). Defenders offer a more limited range of products or services than competitors, focus on resource efficiency and cost-cutting process improvements, and try to protect their domain by offering high quality, superior service, and lower prices, and investing in marketing (Hambrick, 1983; Shankar, 1999). Walker et al. (2003) distinguish two defender strategies: price reduction and competitive differentiation.

Analyzers share strategic characteristics with both defenders and prospectors, and can be thought of as a mid-point between defender and prospector types. They attempt to maintain a stable, limited line of products or

services, but they may move quickly to follow a carefully selected set of the more promising new developments in the industry (Conant et al., 1990). Analyzers are seldom first with new products or services, but they carefully monitor the actions of major competitors in areas compatible with their stable product-market base, and they frequently are second with a more cost-efficient product or service (Conant et al., 1990; Dyer & Song, 1997). For example, they may develop a new product in a stable market domain or sell established products in new geographic markets or through new distribution channels. They may operate in different domains, perhaps one stable and one more turbulent (McDaniel & Kolari, 1987). M–S (1978, p. 73) characterize analyzers as "avid followers of change," always ready to pursue a promising, emerging product or market with a later-entrant, "second-but-better" strategy (Robinson et al., 1992). They may initiate product and/or market development but less often than prospectors and they may focus on stability and efficiency but to a lesser extent than defenders (Hambrick, 1983).

Reactors typically lack long-term plans and any consistent strategy; instead they respond to environmental pressures as necessary (McDaniel & Kolari, 1987). Empirical studies suggest that prospectors, analyzers, and defenders all perform well (Conant et al., 1990; M–S, 1978) and generally outperform reactors.

In our study, we are primarily interested in the relative capabilities of the three potentially successful strategic types, so we do not include reactors in our hypotheses concerning relative capabilities. We have gathered data from reactor organizations, however, and included them in our analysis and our discussion of results.

Firm capabilities

To create economic value, sustain competitive advantage, and achieve superior profitability, an organization requires a wide range of capabilities (Day, 1994). As described in the introduction section, we focus on four important capabilities: technology, IT, market-linking, and marketing capabilities.

These four capabilities are important for competitive advantage (DeSarbo et al., 2006; Moorman & Slotegraaf, 1999) but exist at very different levels of development in each organization. The Resource-Based View (RBV) of the firm has been used to explain how firms allocate their scarce resources to obtain and exploit competitive capabilities (Barney, 1986, Barney & Zajac, 1994; Wernerfelt, 1984; see also Penrose, 1959). The RBV suggests that the mere possession of capabilities is a necessary but not sufficient condition for superior performance. Rather, the firm that has the resources and abilities to put its capabilities to best use, and that invests in capabilities that complement the existing capability base, will be best able to exploit its distinctive competencies. The firm that does this will be rewarded with sustainable competitive advantage and improved long-term performance. According to the RBV, then, firms should allocate their scarce resources to solidifying and developing capabilities that are consistent with their strategic type, as the M–S classification leads one to expect. Prospectors, for example, tend to compete by anticipating latent customer needs or new product opportunities, and by skill in technological innovation. Continued, successful prospecting will therefore require strong technology and IT capabilities. Similarly, successful defending requires strong market-linking and marketing capabilities. If strategic type moderates the capability-performance relationship, then the RBV suggests that organizations should allocate their scarce resources to further develop the capabilities most closely related to their own performance. The next sections explore the hypothesized relationships between strategic type and the four firm capabilities.

Technology capabilities

Technology capabilities concern the manufacturing processes, technology, new product development, production facilities, and the forecasting of technological change in the industry. These skills are contained within the organization and are activated by market, competitor, and external challenges and opportunities. By allowing increased efficiency in the production process, they can reduce costs and improve consistency in delivery and, therefore, competitiveness (Day, 1994; Lumpkin & Dess, 1996; Slater & Narver, 2000).

Technology capabilities are important for all strategic types but most especially for prospectors, who thrive in unstable, changing environments, particularly those marked by rapid technological change, such as biotechnology, medical care, and aerospace (Walker et al., 2003). Since prospectors use a first-to-market strategy and typically operate within a broad product-market domain that undergoes periodic redefinition (Robinson et al., 1992), they must be able to develop new technologies, products, and markets rapidly to address latent market needs (Conant et al., 1990; McDaniel & Kolari, 1987). Walker et al. (2003) note that prospectors require strength in product R&D and product engineering, and they perform best when the amount spent on product R&D is high. The RBV would suggest that prospectors should prioritize development of technology capabilities in order to achieve sustainable competitive advantage. Because defenders typically locate and maintain a secure niche in a relatively stable product or service area, they tend to be less interested in developing new products and technologies and, therefore, less dependent on technology capabilities. Formally stated,

H1. Along the prospector–analyzer–defender continuum, prospectors will have the greatest relative technology capabilities and defenders the least.

IT capabilities

A firm active in product development must be able to gather technical and market information effectively and disseminate it throughout the organization (Griffin & Hauser, 1992; Narver & Slater, 1990). IT capabilities facilitate internal communication and cross-functional integration. Better IT is associated with greater strategic flexibility and, ultimately, with better financial performance and greater organizational success (A. S. Bharadwaj, S. G. Bharadwaj, & Konsynski, 1999; Swanson, 1994). Day (1994) notes that more creative use of IT should lead to better financial performance. Others find that greater information transmission across functional areas leads to more successful new products (e.g., Griffin & Hauser, 1992; Song & Montoya-Weiss, 2001).

As discussed above, prospectors typically operate within a broad product-market domain that undergoes periodic redefinition. They also rely on the rapid development of new products and new markets (Robinson et al., 1992). Thus, prospectors need relatively high IT skills to respond rapidly to early signals of opportunity. M–S (1978) note that prospectors tend to have the most complex coordination and communication mechanisms. Because of the technologically advanced nature of the products they develop, prospectors are also more likely to encounter conflicts among marketing, R&D, engineering, and possibly other functional areas (Dyer & Song, 1997; Walker et al., 2003). This makes it even more critical for prospectors to communicate internally as effectively as possible and to ensure the free flow of information throughout the organization. Furthermore, prospectors may need more strategic flexibility than the other types, since they must constantly monitor and target emerging technology and product opportunities; greater IT contributes to greater strategic flexibility (Bharadwaj et al., 1999). Thus, the RBV would suggest the following hypothesis:

H2. Along the prospector–analyzer–defender continuum, prospectors will have the greatest relative IT capabilities and defenders the lowest.

Market-linking capabilities

Market-linking capabilities allow the organization to compete by detecting market changes, anticipating shifts in the market environment, creating and retaining durable links with customers, and creating strong bonds with channel members, such as wholesalers and retailers. These capabilities enable the organization to sense marketplace requirements before competitors and to connect its other capabilities to the external environment (Day, 1994; Day & Nedungadi, 1994; Slater & Narver, 2000). One could argue that all firms should possess a high level of relative market-linking capabilities. However, we content that compared to prospectors, defenders need a higher level of market-linking capabilities for several reasons: (1) defenders must quickly anticipate changes in the market and their customers' needs if they are to maintain their prominence within a product-market domain (Conant et al., 1990); (2) because defenders attempt to maintain a secure niche in a stable product or service area, they tend to offer a limited range of products or services than competitors, and they tend to protect their domain by offering quality, service, price, and so forth.

The RBV also suggests that defenders would need to develop and maintain a high level of market-linking capabilities in order to exploit their distinctive competencies and develop sustainable competitive advantage. Walker et al. (2003) note that tracking changes in customer needs and competitive behavior is especially important to a differentiated defender strategy. They point out that defenders should be strongest in business functions related to their competitive strategy, such as market sensing and linking. Prospectors also need good market-linking capabilities, but their ability to sustain competitive advantage is more closely tied to the development of new products, markets, and technologies. Formally, we hypothesize that,

H3. Along the prospector–analyzer–defender continuum, prospectors will have the least relative market-linking capabilities and defenders the greatest.

Marketing capabilities

Marketing capabilities include knowledge of the competition and of customers, as well as skill in segmenting and targeting markets, in advertising and pricing, and in integrating marketing activity. Conant et al. (1990) found that prospector firms have distinctive competencies in marketing planning, allocation of marketing resources, revenue forecasting, and control of marketing activities. Although both prospectors and defenders require skills in marketing and market research in order to succeed (Walker et al., 2003), certain marketing capabilities are most important to defender firms, since they are most concerned about protecting products and retaining customers by investing relatively heavily in marketing (McDaniel & Kolari, 1987; Shankar, 1999). Walker et al. (2003) note that differentiated defenders must be able to communicate their

products' unique advantages so as sustain customer satisfaction and loyalty, whereas low-cost defenders must be able to standardize effective marketing programs across all customer segments as part of their overall cost-reduction objective (they will also focus on reduced operation and manufacturing costs for the same reason). Again, using an RBV rationale, since both categories of defenders rely on marketing capabilities, they should develop these to a greater degree than do other strategic types.

H4. Along the prospector–analyzer–defender continuum, prospectors will have the lowest relative marketing capabilities and defenders the greatest.

The moderating effects of strategic type on capability-performance relationship

If it is important for an organization to develop the capabilities most critical to success for its strategic type, then this should be reflected in financial performance. Thus, we hypothesize that strategic type moderates each of the capability–performance relationships as follows:

H5. The effect of technology capabilities on financial performance is higher for prospectors than for defenders.
H6. The effect of IT capabilities on financial performance is higher for prospectors than for defenders.
H7. The effect of market-linking capabilities on financial performance is lower for prospectors than for defenders.
H8. The effect of marketing capabilities on financial performance is lower for prospectors than for defenders.

Materials and methods

Research instrument development and validation process

Well-defined constructs should be based on theory, and the operationalization of these constructs through measures with high degrees of validity and reliability is a prerequisite for any study (Churchill (1979). The definition of M–S typology was given by M–S (1978). In a pioneering study, Conant et al. (1990) developed an 11-item scale for classifying M–S typology. The scale had been well-validated and used in many empirical studies. Thus, we adopt the scale for our study.

Our constructs for the four capabilities are defined based on competitive capability theory (Day, 1994). Our review of the marketing and management literature, however, found no existing scales for the capabilities. We therefore carried out a three-step instrument development procedure.

Step 1: Measurement items for each of capabilities We identified relevant measurement scales from the marketing literature. For example, Conant et al. (1990) developed the measures for marketing capabilities. We grouped the scale items derived from these scales into the four capability types. To this initial pool of items for each capability type, we added new items in instances where it was felt that not all the dimensions of the construct had been sufficiently covered.

To ensure content validity and the appropriateness of items, we refined the scales through in-depth focus interviews in two SBUs. The interviews consisted of three parts. First, executives were asked their opinions regarding salient issues in SBU capabilities. In particular, we wanted to investigate the best way to measure capabilities. Second, the executives were asked to evaluate whether our study hypotheses described their own experiences adequately. The third part of the interviews addressed executives' perceptions of the relevance and completeness of scale items drawn from our literature review and earlier case studies.

The field research revealed that the best way to measure capabilities was to ask the informant to rate their firms on the various capabilities, *relative to their "top three" competitors in the industry*. The field research also revealed that managers had little difficulty in identifying the top three competitors in their respective industries, or in performing the rating task. Furthermore, managers had no problem in rating their SBU on each scale item relative to their three top competitors, on an 11 point scale ranging from 0 (much worse than our three top competitors) to 10 (much better than our three top competitors). We use a standard accounting measure to measure financial performance: the ratio of before-tax profit to revenues. Finally, the Conant et al. (1990) strategic typology scale was also tested. Managers were found to have no difficulty using this scale, and we concluded that this scale, previously validated by Conant et al., did not require any further developments.

Step 2: Scale Development Following Churchill's (1979) recommendation, we assessed construct validity of the scales being developed, correcting any scale items that may still be ambiguous and identifying subsets of items that possessed "different shades of meaning" to informants. Seven judges (two professors and five doctoral students with background in measurement development) were asked to sort the items from the first step into the four capability scales, following Davis's (1986) procedure. First, the judges were presented with the construct definition of each capability type, and asked to assess how well the items developed in Step 1 fit the construct definitions. Second, a set of index cards with each scale item on a card were shuffled into random order and presented to the judges. Working independently, the

judges sorted the cards into the four capability types. Then, construct convergence and divergence were examined by assessing inter-rater reliability.[1]

Step 3: Instrument Pretesting Based on the results of Step 2, we reexamined all scale items and eliminated inappropriate or ambiguous items or any that were inconsistently classified. The four scales were combined into an overall instrument for additional pretesting. The instrument was distributed to 32 managers in the two SBUs to further assess scale reliability and validity. This pretest resulted in two problematic items being deleted. Then, the instrument was distributed to 41 EMBA students taking a new product development class.

Factor analysis and assessment of reliability identified two items that did not load on the appropriate factor and thus were deleted. The final questionnaire included all items judged to have high consistency and face validity. Our pretests again suggested that managers had very little difficulty identifying who the top three competitors were and had no trouble in rating the capabilities on each scale item relative to their three top competitors.[2]

Data collection

The sampling frame was developed by combining two business firm lists, *Ward's Business Directory* and the *Directory of Corporate Affiliations*. All firms in this combined sampling frame were numbered, and 800 numbers were chosen with a random numbers generator.

Contact persons at each firm were asked to select an SBU/division for participation and to provide the name of an appropriate respondent. To encourage participation, we offered a list of available research reports, included a signed confidential agreement, and promised to provide a report of the research results. Of the 800 firms contacted, 392 provided the necessary contacts at the SBU/division level. These were sent a personalized letter and a questionnaire. We sent a reminder and then a second follow-up letter with another copy of the questionnaire (Dillman, 1978). Two items at the end of the instrument assessed respondents' confidence in their ability to answer the questions. Those with a low level of confidence (a score less than 6) were excluded from the final sample. We received useable data from 308 firms. We then sent the four capabilities questionnaire to the SBU manager, followed again by a reminder, then a second follow-up letter with another copy of the survey. We received information on four capabilities from 216 firms. This represents an effective response rate of 27%.

Finally, actual data on revenues and profit before tax (expressed in dollars) were collected from company records. Profit margin was calculated for each SBU.

The final sample included the following industries: computer related products; electronics; electric equipment and household appliances; pharmaceuticals, drugs and medicines; machinery; telecommunications equipment; instruments and related products; air-conditioning; chemicals and related products; and transportation equipment. The before tax profit margin for the final sample ranged from −17.26 to 70.27% and the average percentage of profit margin is 7.87%.

Measurement validation

Before testing the hypotheses, we performed principal factor analyses with varimax rotation. This procedure produced four factors (corresponding to the four capabilities). The factor loadings are reported in Table 1, which indicates that all factors are distinguishable and well defined, and 72% of the variance is explained by the four factors. An examination of the diagonal of the factor score covariance matrix indicated that all factors are internally consistent and well defined by the measurement items. Table 2 reports descriptive statistics.

The measures were further subjected to confirmatory factor analysis using the procedure recommended by Anderson and Gerbing (1988), and the results showed good model fit (results available from the authors). Construct reliabilities for the four capability measures all exceeded the critical value of 0.70 (see Table 1), suggesting that the measures are highly reliable (Peter, 1979, 1981). We also established convergent and discriminant validity for the capability measures using commonly accepted techniques.[3]

Examination of the patterns of item–item correlations and item–total correlations further indicated that there were no deviations from the internal consistency and external consistency criteria suggested in the literature (Anderson & Gerbing, 1982). Thus, we conclude that our constructs possess unidimensionality, have high reliability, and have internal consistency.

Analysis and results

Classification of strategic type

We classified SBUs as prospector, analyzer, defender, or reactor using the "majority-rule decision structure" (see

[1] Details on this procedure are available from the authors on request.
[2] Factor loadings and reliability test results are available from the authors, as is a list of the final measurement items and the response format employed in the questionnaire.
[3] Available from the authors on request.

Table 1 Factor loadings from principal component factor analysis, and construct reliabilities

Four capabilities	
Technology capabilities	
Manufacturing processes	0.97
Technology development capabilities	0.93
Ability of predicting technological changes in the industry	0.90
Production facilities	0.92
New product development capabilities	0.91
Eigenvalue of this factor	6.10
% variance explained by this factor	29.1
Construct reliability	0.97
IT capabilities	
Information technology systems for facilitating cross-functional integration	0.71
Information technology systems for new product development projects	0.80
Information technology systems for internal communication (e.g., across different departments, levels of the organization, etc.)	0.75
Information technology systems for facilitating technology knowledge creation	0.66
Information technology systems for facilitating market knowledge creation	0.74
Eigenvalue of this factor	1.66
% variance explained by this factor	7.9
Construct reliability	0.83
Market-linking capabilities	
Market sensing capabilities	0.85
Customer-linking (i.e., creating and managing durable customer relationships) capabilities	0.80
Capabilities of creating durable relationships with our suppliers	0.81
Ability to retain customers	0.79
Channel-bonding capabilities (creating durable relationships with channel members such as wholesalers, retailers, etc.)	0.65
Eigenvalue of this factor	3.04
% variance explained by this factor	14.4
Construct reliability	0.84
Marketing capabilities	
Knowledge of competitors	0.90
Effectiveness of advertising programs	0.58
Integration of marketing activities	0.86
Skill to segment and target markets	0.85
Effectiveness of pricing programs	0.62
Knowledge of customers	0.89
Eigenvalue of this factor	4.22
% variance explained by this factor	20.1
Construct reliability	0.90

Conant et al., 1990 for details), which requires six "correct" responses on the scale. We made the following modification: for an SBU to qualify as a prospector or a defender, at least seven correct answers were required. Using this procedure, we classified the 216 SBUs/divisions as follows: 62 prospectors, 79 analyzers, 59 defenders, and 16 reactors. The proportions we obtained in each strategic type are roughly equivalent to those obtained by Conant et al. (1990) when they classified their sample of SBUs using their scale.

Testing of hypotheses (H1–H4)

To test the first four hypotheses (H1–H4), we performed a MANOVA to compare the scores on each of the four capability scales across all four strategic types using the SAS GLM procedure. For each capability scale, a multiple-item scale was obtained by a simple average of the items. As shown in Table 3, the MANOVA F-statistic was significant for IT, market-linking, and marketing capabilities, so pairwise comparisons were computed to examine the nature of the differences in relative capabilities among the four strategic types. The t test results of the pairwise comparisons are also shown in Table 3.

We find support for a hypothesis if two or more of the possible three pairwise comparisons are significant ($p<0.05$ level) and in the hypothesized direction, and partial support if only one pairwise comparison is significant and in the hypothesized direction. Pairwise comparisons with reactors are excluded from analysis as they are not part of the hypotheses. The results in Table 3 indicate the following regarding H1–H4:

- H1 is partially supported as prospectors have greater technology capabilities than defenders.
- H2 is supported as IT capabilities of prospectors are significantly greater than those of analyzers, which in turn are greater than those of defenders.
- H3 is supported as the relative market-linking capabilities of defenders and analyzers are significantly greater than those of prospectors, although the difference between defenders and analyzers is not significant.
- H4 is also supported as defenders have significantly greater marketing capabilities than analyzers, and analyzers have significantly greater marketing capabilities than prospectors.

In summary, we expected prospectors to be strongest in technology and IT capabilities and defenders to be stronger in market-linking and marketing capabilities. Our empirical results provide supports for all hypothesized directions.

Testing the moderating effects of M–S typology on the capability–performance relationship (H5–H8)

Hypotheses H5 through H8 concerned the moderating effect of strategic type on the relationship between capabilities and financial performance. To examine the significance of the moderating effects of strategic type, we performed hierarchical regression analysis as recommended

Table 2 Means, standard deviations, and correlations

	Mean	Standard deviation	Correlation				
			P	ML	TE	MK	IT
Profit margin (P)	7.87	12.17	1.00				
Market-linking capabilities (ML)	2.26	1.82	0.10	1.00			
Technology capabilities (TE)	2.80	2.62	0.49	−0.04	1.00		
Marketing capabilities (MK)	2.41	1.88	−0.01	0.15	−0.07	1.00	
IT capabilities (IT)	6.61	1.84	0.47	−0.13	0.35	−0.45	1.00

by J. Cohen and P. Cohen (1983). To reduce multicollinearity, we mean-centered the four capabilities and financial performance variables, as suggested by Jaccard, Turrisi, and Wan (1990). The resulting variable inflation factor (VIF) scores for all models were within acceptable parameters, giving us confidence that multicollinearity was not an issue (Chatterjee et al., 2000). Therefore, the mean-centered data were used in subsequent data analyses.

We performed hierarchical regression analyses using the mean-centered data. The model was run with all main effects of the strategic type and the four capabilities first (Model 1), with interaction terms of strategic type and capabilities being added later (Model 2). We used the following *F*-statistic to test the null hypothesis that the coefficients of all interactions between strategic type and capabilities are zero (i.e., Model 1 better than Model 2),

$$F_{95\%}(q, n-k) = \frac{\frac{\text{RSSR}-\text{RSSU}}{q}}{\frac{\text{RSSU}}{n-k}}$$

where RSSR = residual sum of squares of the restricted regression (i.e., Model 1); RSSU = residual sum of squares of the unrestricted regression (i.e., Model 2); q = number of restrictions; k = total number of parameters in the model; and n = total number of observations.

The result indicates that $F_{95\%}(12,196)=2.81$, rejecting the null hypothesis at 95% confidence level. We conclude that there is empirical evidence supporting the moderating effects of the strategic type on the capability–performance relationship. Therefore, we tested hypotheses H5–H8 using Model 2 (i.e., the unrestricted full model). The results are presented in Table 4. The R^2 is 0.58 which indicates that the theoretical model explains 58% of the variance in SBU financial performance.

The results in Table 4 indicate that when the moderating effects of strategic type are omitted from the model (Model 1), all strategic dummy variables and four capabilities have significant and positive effects on performance ($p<.05$). However, as we discussed above, both theoretical reasons and the empirical results provide support for including strategic type as a moderator to the capability–performance relationship. Once, the moderating variables are entered into the model, the main effects of all four capabilities become insignificant at $p<.05$. Consistent with our hypotheses (H5–H8), these results indicate that capabilities alone do not have positive effects on performance. Instead, the effects are moderated by strategic type.

According to H5 and H6, the effect of technology and IT capabilities on financial performance should be higher for

Table 3 Analysis of variance results: relative capabilities and strategic types

	Strategic type				Univariate *F* value*	Paired comparisons (*t* tests)[a]	Is the hypothesis supported?
	Prospector	Analyzer	Defender	Reactor			
Technology capabilities	3.42 (2.70)	2.78 (2.46)	2.25 (2.59)	2.46 (2.90)	2.16 (ns)	P>D	Partially supported
IT capabilities	7.95 (1.49)	6.72 (1.79)	5.48 (1.09)	5.05 (1.72)	31.96*	P>A; P>D; A>D(P>R; A>R)	Supported
Market-linking capabilities	1.67 (1.67)	2.35 (1.82)	2.69 (1.79)	2.46 (2.01)	3.52*	D>P; A>P	Supported
Marketing capabilities	1.75 (1.50)	2.37 (1.75)	3.26 (1.99)	1.98 (2.38)	7.47*	D>A;D>P; A>P (D>R ;)	Supported

Each cell gives the mean; standard deviations are in parentheses.
Support means that at least two pairs are significantly different in the hypothesized direction. Partial support means that only one pair is significantly different in the hypothesized direction.
*$p<0.05$.
[a] significant differences at $p<0.05$ are reported. P=prospector; A=analyzer; D=defender; (R=reactor shown but not used in hypothesis testing).

Table 4 Summary of results from hierarchical regression analyses (Dependent variable: financial performance)

	Model 1 Unstandardized coefficients	Standard error	Model 2 Unstandardized coefficients	Standard error
Intercept	−12.74*	2.31	−17.66*	3.17
Prospector[a]	17.32*	2.75	20.66*	3.48
Analyzer[b]	11.96*	2.52	16.92*	3.30
Defender[c]	12.42*	2.53	14.19*	3.60
Technology capabilities	1.73*	0.24	0.43ns	0.92
IT capabilities	1.86*	0.45	−0.73ns	1.40
Market-linking capabilities	1.22*	0.34	0.30ns	1.26
Marketing capabilities	0.91*	0.37	−0.59ns	1.06
Prospector X technology capabilities			1.89*	1.03
Prospector X IT capabilities			2.92*	1.69
Prospector X market-linking Capabilities			0.17ns	1.41
Prospector X marketing capabilities			0.99ns	1.35
Analyzer X technology capabilities			1.72*	1.01
Analyzer X IT capabilities			3.14*	1.55
Analyzer X market-linking capabilities			0.28ns	1.37
Analyzer X marketing capabilities			2.37*	1.26
Defender X technology capabilities			0.48ns	1.04
Defender X IT capabilities			1.31ns	1.79
Defender X market-linking capabilities			2.75*	1.40
Defender X marketing capabilities			2.04*	1.19
R-square	0.50		0.58	
F value	29.96*		13.97*	
Residual sum of squares	15855		13525	

Dummy variables: Prospector =1 if the SBU is classified as a Prospector, 0 if not. Analyzer =1 if the SBU is classified as an Analyzer, 0 if not. Defender =1 if the SBU is classified as a Defender, 0 if not. (Reactors have all three dummy variables = 0.)
*indicates that the coefficient is significant at 95% confidence level with one tail test.

prospectors than for defenders. As indicated in Table 4, the unstandardized coefficients representing the interactive effects of technology capabilities (1.89) and IT capabilities (2.92) on prospectors' financial performance are positive and significant ($p<0.05$). The interactions between these two capabilities (0.48 and 1.31, respectively) on defenders' financial performance are both not significant ($p<0.05$). Therefore, strong relative technology and IT capabilities boost the financial performance of prospectors but have an insignificant effect on the financial performance of defenders. This result supports both H5 and H6.

H7 and H8 state that the effect of market-linking and marketing capabilities on financial performance should be lower for prospectors than for defenders. These hypotheses are also supported. The interactive effects of these two capabilities on defenders' financial performance are positive (2.75 and 2.04, respectively) and significant ($p<0.05$). These interactive effects are not significant in the case of prospectors (0.17 and 0.99, respectively). Note also that analyzers represent a middle ground between the two extremes. As shown in Table 4, three of the four interactive effects are significant and positive for analyzers (technology, marketing, and IT capabilities).

Other empirical observations

Two additional observations unrelated to hypothesis testing but of relevance here, can be made from an inspection of Table 4. First, we discover a significant main effect on strategic type on profitability. Prospectors outperform analyzers, analyzers outperform defenders, and defenders outperform reactors in profitability. This can be seen by examining the dummy variable coefficients for the strategic types. These are all positive (20.66 for prospectors, 16.92 for analyzers, and 14.19 for defenders, respectively) and significant at $p<0.05$. This is interesting finding because the literature provides conflicting findings on this issue. While many studies suggest that there were no significant differences in performance across different strategic types (except that reactors have the worst performance), others found some performance differences (see discussions in Miles & Snow, 1978; Conant et al., 1990; Dyer & Song, 1997).

Second, the lack of main effects of the capabilities on performance appears to be somewhat against the conventional wisdom, and against prior research on capabilities (Day, 1990, 1994; Day & Nedungadi, 1994). Before controlling for the moderating effects of strategic type, the

main effects are 1.73 for technology capabilities, 1.86 for IT capabilities, 1.22 for market-linking capabilities, and 0.91 for marketing capabilities, respectively ($p<0.05$). However, after controlling for the moderating effects of strategic type, we find only interaction effects of capabilities on performance. Nevertheless, our results indicate the importance of different capabilities to firms of different strategic types, and thus provide insights not revealed in previous empirical studies that did not decompose the sample by strategic type. While majority of the literature contend that all capabilities are positively related to performance, we find that the positive capability-performance relationship only holds for certain strategic types and that the size of the effects differs across different strategic types. For example, technology and IT capabilities are significantly positively related to success for prospectors, but not for defenders. Market-linking and marketing capabilities are significantly related to success for defenders, but not for prospectors. And three of the four capabilities are linked to success for analyzers (that is, to carry out their strategy, analyzers must be able to act either as a defender or as a prospector, and consequently need capabilities to perform either role. Thus, the only significant findings with respect to the capabilities are the interactions with strategic type, and all the significant effects are consistent with H5–H8.

Discussion

The M–S strategic typology has been validated in a wide variety of settings and frequently used by researchers in marketing and other functional areas since its initial publication in 1978. According to M–S, organizations adopt certain strategies in response to environmental change. That is, they choose to be pioneers in product or market development or to protect an existing position within their niches, or they seek some kind of intermediate position between these two. As a result, firms exhibit relatively consistent patterns of product-market innovation decisions in response to environmental shifts. Furthermore, a firm develops certain capabilities that help implement its strategy, which increases the likelihood that it will continue to use the same strategy in response to future environmental shifts. As Hambrick (1983, p. 7) notes, "prospectors tend to want to continue prospecting; defenders tend to want to continue defending." Among the capabilities investigated by M–S are technology, structure, management processes, and power distribution.

The M–S typology is, above all, related to innovation. In this study, we mapped four major capabilities to innovating firms onto the M–S typology. We should note here that the four capabilities can be grouped into two categories. Consider first the capabilities hypothesized to be most important to defenders: marketing and market-linking capabilities. While these are admittedly related conceptually, we argue that these indeed are different, and make two arguments to support this claim. First, the scale items of each construct are drawn from different domains. Market-linking capabilities all have to do with market sensing, market-linking, channel bonding, and similar relationship-building capabilities. Marketing capabilities, as Conant et al. (1990) defined them, pertain to capabilities such as skill at segmentation, advertising and pricing, knowledge of customers and competitors, and ability to integrate marketing programs. Second, the confirmatory factor analysis reveals that these two capabilities are distinct, which supports our claim that they are different (though perhaps conceptually related) constructs. Similarly, consider the two capabilities hypothesized to be most strongly related to prospector performance: technology and IT capabilities. Technology capabilities have to do with manufacturing, production, and new product development, while IT capabilities pertain more to information technology systems. Again, these are conceptually related though distinct constructs, and the CFA supports this claim.

We then tested all our hypotheses concerning these four capabilities. First, we hypothesized that prospectors, which typically pursue a first-mover strategy through product-market innovation, will need technology and IT capabilities that are required in order to identify and satisfy latent customer needs. Defenders, who are most concerned with preserving protected market segments with existing technology, need market-linking and marketing capabilities, which are most essential in identifying and satisfying manifest customer needs better than competitors. We find supporting evidence for all these hypotheses. Second, we hypothesized that prospectors who are strong in technology and IT capabilities will gain profitability rewards, as will defenders who are strong in market-linking and marketing capabilities. These hypotheses also are supported by our data.

Theoretical implications

Our empirical results provide supports for our hypotheses that strategic type moderates the relationship between capabilities and performance. These results are consistent with the resource-based view (RBV) of the firm (Barney, 1986; Wernerfelt, 1984). According to the RBV, the possession of capabilities by a firm does not by itself increase performance. It is possession of the capability, and its correct deployment, that leads to sustainable competitive

advantage and, ultimately, improved long-term performance. We find that capabilities do not by themselves have a main effect on performance; this finding is consistent with RBV. Rather, it is the interactions between strategic types and capabilities that have significant positive effects on performance. Furthermore, the interactions that we found significant agree with those that are expected in our hypotheses. Technology and IT capabilities have significant impacts on performance for prospectors, while market-linking and marketing capabilities have significant impacts on performance for defenders. This is related to correct deployment as predicted by RBV: prospectors benefit the most by deploying capabilities closely (theoretically) related to prospecting; same argument for defenders. Analyzers appear to be a combination of the two other strategic types as three of the four capabilities have significant impacts on performance for this type.

These findings have several implications for theory development in both strategic management and marketing literatures. Relative to other organizations, prospectors develop technology and IT capabilities so that they may pursue first-to-market initiatives while defenders develop market-linking and marketing capabilities so that they may respond effectively to marketplace changes. These findings support the M–S typology and the contention that organizations tend to respond in certain consistent ways to environmental change. The findings also support the "latent versus manifest customer need" distinction found in the market orientation literature (Baker & Sinkula, 1999; Slater & Narver, 1995, e.g.), which suggested that market-oriented firms can concentrate on satisfying manifest needs better than competitors (reactive market orientation), or seek to identify latent needs, which requires investment in new product and/or new market development (proactive market orientation). Our findings are also consistent with Hambrick's (1983) contention that prospectors want to keep prospecting and, consequently, develop the capabilities most closely related to prospecting more than do other firms. Because IT has evolved so much in the past few years, future research should explore its effect on strategic choices. Our study is a step in that direction.

Managerial implications

Two interesting managerial implications emerge from this study. The first concerns the alignment between capabilities and strategic type. According to the RBV, a firm needs to invest in and exploit its capabilities in order to capitalize on them, improve performance, and earn sustainable competitive advantage. Our results show that the capabilities that ought to be developed for maximum performance differ in ways predicted by the M–S typology. This does not necessarily mean that a firm's strategic type is unchangeable. Rather, the firm should assess its strengths and recognize its weaknesses in light of external challenges. It should then review its strategic stance, deciding how it can best allocate its scarce resources to support the chosen strategy, or even through time to adjust strategic type so it is more in line with its capabilities. It is important in this context to recognize the complementary relationship between capabilities and strategies. Relative strengths in technology and information technology capabilities suggest that a prospector strategy is most appropriate. Consistent, successful pursuit of a prospector strategy over time should help a firm develop these relative strengths and allow it to retain its competitive advantage. Similarly, strengths in market-linking and marketing capabilities are particularly important to firms pursuing a defender strategy; firms that have strengths across many capabilities are candidates for pursuing an analyzer strategy. Firms that are reactors should use their internal assessment to decide which other strategic type they should strive to become.

A second and related implication concerns resource allocation. Certain capabilities appear to be important in driving the financial performance of different strategic types. To improve profitability, organizations need to identify which capabilities they are adequately supporting and which are being under supported. For example, to improve financial performance, is it better to invest in technology or market-linking capabilities? The answer is that it depends on the firm's strategic type: this is again consistent with the RBV and is supported by our results. According to Table 4, defenders stand to improve their financial performance by increasing market-linking and marketing capabilities; an increase in IT capability would not significantly increase profit. The defender may examine the particular scale items that comprise market-linking capabilities (e.g., market sensing, customer linkage, supplier relationships) to determine specifically where more investment should be made. By contrast, Table 4 shows that the prospector would be better to take the same investment and use it to support technology activities. To determine exactly what it would need to invest it, the prospector can consider the scale items specific to inside-out capabilities (its manufacturing processes, technology development capabilities, production facilities, and so on).

Limitations and future research

This study has produced several counter-intuitive and provocative findings. More in-depth future research is needed to explore the underlying reasons for the relation-

ships depicted in the data. Readers are cautioned with several study limitations. First, we have only examined four capabilities. There are other important organizational capabilities such as financial management and human resource management capabilities. Future research should explore the effect of other capabilities on financial performance and how strategic type moderates the capability–performance relationship.

Second, this study suffers from the normal limitations inherent in survey-based research. The study is cross-sectional and relies in part on self-reported information, though we also use objective profit and revenue data. We are only observing phenomena and relationships that typically will play out over a long period of time. While our data do reveal strong support for our hypotheses, it must be noted that the phenomena are longitudinal in nature. A future research extension would possibly be to observe the effect of investments in capabilities longitudinally on SBU performance. However, such a study will be very difficult to execute.

Appendix A

Study measures

A. Financial performance and capabilities scales

Table 5

Table 5 Financial performance and capabilities scales

Construct, measurement sources, response format, and reliability	Measurement items
Dependent variable	
Financial performance	Total profit before-tax/total revenues
Independent variables:	
Technology capabilities (Day, 1994) Please evaluate how well or poorly you believe that this selected business unit possesses the specific capabilities relative to your top three competitors in the industry (11 point scale: 0=Much worse than your top three competitors; 10=Much better than your top three competitors.) (construct reliability=0.97)	Manufacturing processes Technology development capabilities Ability of predicting technological changes in the industry Production facilities New product development capabilities
Information technology capabilities (new scale) Please evaluate how well or poorly you believe that this selected business unit possesses the specific capabilities relative to your top three competitors in the industry (11 point scale: 0=Much worse than your top three competitors; 10=Much better than your top three competitors.) (construct reliability=0.83)	Information technology systems for facilitating cross-functional integration Information technology systems for new product development projects Information technology systems for internal communication (e.g., across different departments, across different levels of the organization, etc.) Information technology systems for facilitating technology knowledge creation Information technology systems for facilitating market knowledge creation
Market-linking capabilities (Day, 1994) Please evaluate how well or poorly you believe that this selected business unit possesses the specific capabilities relative to your top three competitors in the industry (11 point scale: 0=Much worse than your top three competitors; 10=Much better than your top three competitors.) (construct reliability=0.84)	Market sensing capabilities Customer-linking capabilities (i.e., creating and managing durable customer relationships) Capabilities of creating durable relationship with our suppliers Ability to retain customers Channel-bonding capabilities (creating durable relationship with channel members such as wholesalers, retailers, etc)
Marketing capabilities (Conant et al., 1990) Please evaluate how well or poorly you believe that this selected business unit possesses the specific capabilities relative to your top three competitors in the industry (11 point scale: 0=Much worse than your top three competitors; 10=Much better than your top three competitors.) (construct reliability=0.90)	Knowledge of competitors Effectiveness of advertising programs Integration of marketing activities Skill to segment and target markets Effectiveness of pricing programs Knowledge of customers

B. Strategic typology scale (adopted from Conant et al., 1990)

The following statements describe some characteristics of this selected strategic business unit/division. Please circle the description that best describes this selected business unit.

1. In comparison to our competitors, the products which we provide to our customers are best described as: (Entrepreneurial—product market domain)
   a. Products that are more innovative, and continually changing. (P)
   b. Products that are fairly stable in certain markets while innovative in other markets. (A)
   c. Products that are stable and consistently defined throughout the market. (D)
   d. Products that are in a state of transition, and largely respond to opportunities and threats in the marketplace. (R)
2. In contrast to our competitors, we have an image in the marketplace that: (Entrepreneurial—success posture)
   a. Offers fewer, select products which are high in quality. (D)
   b. Adopts new ideas and innovations, but only after careful analysis. (A)
   c. Reacts to opportunities or threats in the marketplace to maintain or enhance our position. (R)
   d. Has a reputation for being innovative and creative. (P)
3. The amount of time our business unit spends on monitoring changes and trends in the marketplace can best be described as: (Entrepreneurial—surveillance)
   a. Lengthy: we are continuously monitoring the marketplace. (P)
   b. Minimal: we really don't spend much time monitoring the marketplace. (R)
   c. Average: we spend a reasonable amount of time monitoring the marketplace. (D)
   d. Sporadic: we sometimes spend a great deal of time and at other times spend little time monitoring the marketplace. (A)
4. In comparison to our competitors, the increases or losses in demand that we have experienced are due most probably to: (Entrepreneurial—growth)
   a. Our practice of concentrating on more fully developing those markets which we currently serve. (D)
   b. Our practice of responding to the pressures of the marketplace by taking few risks. (R)
   c. Our practice of aggressively entering into new markets with new types of products. (P)
   d. Our practice of assertively penetrating more deeply into markets we currently serve, while adopting new products after a very careful review of their potential. (A)
5. One of the most important goals in this business units in comparison to our competitors is our dedication and commitment to: (Engineering—technological goal)
   a. Keep our costs under control. (D)
   b. Analyze our costs and revenues carefully, to keep costs under control and to selectively generate new products or enter new markets.(A)
   c. Insure that the people, resources and equipment required to develop new products and new markets are available and accessible. (P)
   d. Make sure we guard against critical threats by taking any action necessary. (R)
6. In contrast to our competitors, the competencies (skills) which our managerial employees possess can best be characterized as: (Engineering—technological breadth)
   a. Analytical: their skills enable them to both identify trends and then develop new products or markets. (A)
   b. Specialized: their skills are concentrated into one, or a few, specific areas. (D)
   c. Broad and entrepreneurial: their skills are diverse, flexible, and enable change to be created. (T)
   d. Fluid: their skills are related to the near-term demands of the marketplace. (R)
7. The one thing that protects us from its competitors is that we: (Engineering—technological buffers)
   a. Are able to carefully analyze emerging trends and adopt only those which have proven potential. (A)
   b. Are able to do a limited number of things exceptionally well. (D)
   c. Are able to respond to trends even though they may possess only moderate potential as they arise. (R)
   d. Are able to consistently develop new products and new markets. (P)
8. More so than many of our competitors, our management staff in this business unit tends to concentrate on: (Administrative—dominant coalition)
   a. Maintaining a secure financial position through cost and quality control. (D)
   b. Analyzing opportunities in the marketplace and selecting only those opportunities with proven potential, while protecting a secure financial position. (A)
   c. Activities or business functions which most need attention given the opportunities or problems we currently confront. (R)
   d. Developing new products and expanding into new markets or market segments. (P)
9. In contrast to many of our competitors, this business unit prepares for the future by: (Administrative—planning)

a. Identifying the best possible solutions to those problems or challenges which require immediate attention. (R)
b. Identifying trends and opportunities in the marketplace which can result in the creation of product offerings which are new to the industry or reach new markets. (P)
c. Identifying those problems which, if solved, will maintain and then improve our current product offerings and market position. (D)
d. Identifying those trends in the industry which our competitors have proven possess long-term potential while also solving problems related to our current product offerings and our current customers' needs. (A)

10. In comparison to our competitors, our organization structure is: (Administrative—structure)

a. Functional in nature (i.e., organized by department-marketing, accounting, personnel, etc.) (D)
b. Product or market oriented. (P)
c. Primarily functional (departmental) in nature; however, a product or market oriented structure does exist in newer or larger product offering areas. (A)
d. Continually changing to enable us to meet opportunities and solve problems as they arise. (R)

11. Unlike our competitors, the procedures we use to evaluate performance are best described as:

a. Decentralized and participatory encouraging many organizational members to be involved. (P)
b. Heavily oriented toward those reporting requirements which demand immediate attention. (R)
c. Highly centralized and primarily the responsibility of senior management. (D)
d. Centralized in more established product areas and more participatory in new product areas. (A)

Note: In parentheses, we indicate for each scale item the answer that corresponds to strategic type (P = prospector, A = analyzer, D = defender, R = reactor). In the questionnaire, the letters P, A, D, and R were not provided to the respondents.

Appendix B

Additional Tables

Table 6

Table 6 Firms illustrating Miles–Snow strategic types

Prospectors	Analyzers	Defenders	Reactors
Hewlett-Packard rationale: continuously searches for new products, services, technologies, and markets. Has exhibited Prospector behavior throughout its history.	Matsushita rationale: probably a defender historically; has base of established products in consumer electronics, adding to the base carefully using process, manufacturing, and marketing skills.	National Semiconductor rationale: focuses narrowly on efficient microchip production using advanced process technology.	Liggett and Myers rationale: having no stable strategic focus and a poor internal and external fit; did poorly during cigarette industry's transitional period.
Intel rationale: has been a leader in product innovation in the microprocessor industry.	General Motors rationale: while probably a prospector in the 1960s, seems to have become more like an analyzer today.	Wal-Mart rationale: uses a functional organizational structure and state-of-the-art information system to produce logistical efficiencies; may be becoming more analyzer-like.	Pan Am and other airlines rationale: during time of deregulation, many airlines failed or went bankrupt as strategy, structure, and process were no longer appropriate without government protection.
Rubbermaid rationale: targets high percentage of sales from new products; organizes self-contained, autonomous teams to do this.	R.J. Reynolds rationale: tried new products and new approaches during transitional time in cigarette industry: saw few new brands fail during this time.	American Brands rationale: defended top two cigarette brands (Lucky Strike and Pall Mall) in face of strong competition; was unable to compete on product design or marketing.	
Philip Morris rationale: had high number of new cigarette brand attempts and few failures when faced with industrywide challenges.			

Source: Miles and Snow (1994), pp. 13–14, 16, 76–78, 80.

Table 7

Table 7 Item-to-total correlations

Technology capabilities	
Manufacturing processes	0.975
Technology development capabilities	0.895
Ability of predicting technological changes in the industry	0.864
Production facilities	0.902
New product development capabilities	0.890
IT capabilities	
Information technology systems for facilitating cross-functional integration	0.620
Information technology systems for new product development projects	0.707
Information technology systems for internal communication (e.g., across different departments, levels of the organization, etc.)	0.677
Information technology systems for facilitating technology knowledge creation	0.459
Information technology systems for facilitating market knowledge creation	0.700
Market-linking capabilities	
Market sensing capabilities	0.758
Customer-linking capabilities (i.e., creating and managing durable customer relationships)	0.686
Capabilities of creating durable relationships with our suppliers	0.679
Ability to retain customers	0.635
Channel-bonding capabilities (creating durable relationships with channel members such as wholesalers, retailers, etc.)	0.512
Marketing capabilities	
Knowledge of competitors	0.811
Effectiveness of advertising programs	0.627
Integration of marketing activities	0.758
Skill to segment and target markets	0.733
Effectiveness of pricing programs	0.676
Knowledge of customers	0.786

Appendix C

Additional statistical tests

Inter-rater reliability

Inter-rater reliability was assessed in two ways. First, the percentage of correct placement of items was calculated as the proportion of items placed by the seven judges within the intended theoretical construct. Higher percentages indicate higher degree of construct validity, and a higher potential for good reliability. The minimum percentage obtained was 84%. Five items were responsible for "incorrect" placement, and were deleted from the pool. Second, we calculated Cohen's Kappa (Cohen 1960) for each pair of judges to measure their level of agreement in categorizing items into capability types and product competitive advantages. The Kappa scores ranged from 0.97 to 0.82, greatly exceeding the acceptable level of 0.65 (Jarvenpaa, 1989). We concluded that the scale items were consistently placed within the correct constructs. Therefore, the items demonstrated convergent validity with the related capability, and discriminant validity across the capabilities. Furthermore, because the judges' categorizations of items into strategic types were consistent, we concluded that the scales demonstrated convergent and discriminant validity (Davis, 1986).

Common method bias test

We followed the method proposed by Podsakoff, MacKenzie, Lee, and Podsakoff (2003) and test whether common method bias is present in our data. To do so, we perform an additional CFA on our data, incorporating a common method factor that loads on each item in the final measurement model with all four capabilities. The coefficient for the paths from this additional factor and the four capability constructs are restricted to be zero.

The results suggest that χ^2 (157 d.f.)=688.61. The difference in chi-square between this hypothesized model

Table 8

Table 8 Summary of discriminant validity tests

	Two-factor model		One-factor model		Change	
	Chi-Squared	d.f.	Chi Squared	d.f.	Δ Chi Square	Δ d.f.
Technology capabilities vs. marketing capabilities	300.06	37.00	952.30	38.00	652.24*	1.00
Technology capabilities vs. market-linking capabilities	113.20	32.00	546.35	33.00	433.15*	1.00
Technology capabilities vs. information technology capabilities	245.93	33.00	1143.80	34.00	897.87*	1.00
Marketing capabilities vs. market-linking capabilities	152.41	39.00	794.54	40.00	642.13*	1.00
Market capabilities vs. information technology capabilities	266.85	40.00	784.51	41.00	517.66*	1.00
Market-linking capabilities vs. information technology capabilities	247.02	35.00	667.30	36.00	420.28*	1.00

*$p<0.05$

with a common factor and the original model is 165.74 with 21 degrees of freedom. In addition, the common method factor loadings are statistically significant in only 8 of 21 paths. Thus, the hypothesized model with a common factor model is rejected at the 90% confidence level. We conclude that common method bias is not present in the data.

Based on the above measurement validation procedures, we conclude that the measurement model has good fit and the constructs possess convergent and discriminant validity. Thus, it is appropriate to use the measures for testing our research hypotheses.

Confirmatory factor analysis

The measures were further subjected to confirmatory factor analysis using the procedure recommended by Anderson and Gerbing (1988). We used AMOS 4.0 to conduct confirmatory factor analysis. The model results in χ^2 (178 d.f.)=854.36. While the chi-square statistic is significant, indicating the rejection of the null hypothesis that the model results in perfect fit, the chi-square statistic is not an adequate test of model fit (Bentler & Bonett, 1980). Thus, we complement the chi-square statistic with other, more appropriate measures of fit : Normed Fit Index (NFI)=.84, Incremental Fit Index (IFI)=.87, Tucker–Lewis Index (TLI)=.85, and Comparative Fit Index (CFI)=.87. These results indicate a good fit of the models because the overall fit indices are greater than the acceptable standards (Arbuckle & Wothke, 1999; Bentler & Bonett, 1980; Bollen, 1989). The measurement model was evaluated on the following criteria: unidimensionality, reliability, convergent validity, and discriminant validity.

Unidimentionality, Reliability, and Internal Consistency of the Measures Examinations of the modification indices, residuals, and overall fit indices revealed no substantial departures from unidimentionality. The construct reliabilities are as follows: 0.97 for *Technology Capability*, 0.83 for *IT Capability*, 0.84 for *Market-linking Capability*, and 0.90 for *Marketing Capability*, respectively. These reliabilities exceed the critical value of 0.70, suggesting that the measures are highly reliable (Peter, 1979, 1981; Nunnally, 1978).

Table 7 in Appendix B reports the item-to-total correlations. Examination of the patterns of item–item correlations and item–total correlation further indicated that there were no deviations from the internal consistency and external consistency criteria suggested in the literature (see Anderson & Gerbing, 1982). Thus, we conclude that our constructs possess unidimensionality, have high reliability, and have internal consistency.

Convergent validity To examine the convergent validity, we further assess the standardized loadings of all measurement items to their respective constructs in the measurement model (i.e., the Lambda Xs) (Anderson & Gerbing, 1982). Results indicate that the standardized loadings were *highly* significant because the smallest t value was 5.4. Thus, we conclude that the scales for the constructs have convergent validity.

Discriminant validity We assess discriminant validity by comparing the fit between separate unidimensional and two-dimensional CFA models for each pair of constructs (Dabholkar & Bagozzi, 2002). In the unidimensional model, all measures for the pair of constructs are forced to load on a single factor. In a second model, we release this constraint and allow each measure to load only on its respective factor. As indicated in Table 8 of Appendix B, the values for these chi-square difference tests (with one degree of freedom) range from 420.28 to 897.87 and are statistically significant for each pairwise comparison, indicating discriminant validity in the latent constructs.

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