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ABSTRACT

There is general consensus that coordination and integration are needed to achieve efficient outcomes while distributed decision power and autonomous actions are essential to develop innovative responses. These dual requirements for operational optimization and ongoing business innovation capture the essence of organizational ambidexterity as the means to sustain performance over time when environmental conditions change. This paper incorporates strategic management and organization theoretical rationales in a model that combines elements of integration and experimentation in the strategy making process and thereby extends the evolving literature on the ambidextrous organization. The performance relationships of the ambidextrous integrative strategy making model are investigated on the basis of a cross-sectional sample of 185 business entities operating in different manufacturing industries. Results of structural equation analyses indicate that superior performance in the ambidextrous organizations is associated with efficiencies derived from adherence to centralized strategic planning and effectiveness generated by decentralized innovative behavior through participation and autonomous actions. The study enhances our understanding of ambidexterity as the result of combined strategy making processes that balance the needs for economic efficiency and organizational adaptability.

Key words: Ambidexterity, Dispersed decision-making, Innovation, Participatory decision-making, Strategic planning

INTRODUCTION

There is general consensus that strategic responsiveness and dynamic capabilities constitute essential sources of competitive advantage (Bettis & Hitt, 1995; Teece, Pisano and Shuen, 1997) and decentralized non-hierarchical organizations are considered highly responsive in increasingly dynamic environments (Castells, 1996; Galbraith, 1994, 1995; Nault, 1998). At the same time, however, it is recognized that effective organizations must engage in integrating processes embedded in more rigid structures (Andersen, 2000; Hill, Martin & Harris, 2000; Jellinek & Schoonhoven, 1990). These dual relationships are reflected in the evolving literature on the ambidextrous organization arguing that both operational efficiency and organizational adaptability are essential for survival and success (Gibson & Birkinshaw, 2004; He & Wong, 2004; Tushman & O'Reilly, 1996). Effective ambidextrous organizations must align their structure to reap the benefits from standardization and scale while remaining responsive as environmental conditions change by embracing apparently conflicting logics of exploitation and exploration (Brown & Eisenhardt, 1997; Eisenhardt & Martin, 2000; He & Wong, 2004). This implies a simultaneous focus on strategic responsiveness, structural alignment, and organizational contexts to drive the underlying processes (Tushman & O'Reilly, 1996). While, it is recognized that more complex organizational processes and systems can balance the diverse requirements, there have been few concrete descriptions of process configurations that integrate the diverse elements in practice (Gibson & Birkinshaw, 2004). Furthermore, empirical studies analyzing the implied performance relationships of ambidextrous configurations are in short supply (He & Wong, 2004). Hence, the key contributions of this paper are to outline the essential strategy making processes that circumscribe organizational ambidexterity and demonstrate their alleged performance effects.

In this study, we contend that both centrally planned and decentralized strategy making can be combined as integrative elements in the organizations' complex strategy formation processes and argue that they constitute exploitative and explorative sub-systems (Andersen, 2004; Burgelman, 1996; Hart, 1992; Hart & Banbury, 1994; Hendry, 2000; Mintzberg & Waters, 1985). These strategy making processes co-exist and facilitate

strategic responses while safeguarding economic efficiencies (Brown & Eisenhardt, 1997; Gersick, 1994; Tushman & O'Reilly, 1996). We analyze the performance relationships of the integrative strategy making model on the basis of a cross-sectional sample of 185 single-business entities operating across a diverse set of manufacturing industries thus extending the limited number of empirical studies performed on the effects of ambidexterity (Gibson & Birkinshaw, 2004; He & Wong, 2004). In the following we provide an overview of the extant literatures on strategic management and organization theory to frame our understanding of ambidexterity. Next, we develop hypotheses on the performance relationships of the integrative strategy making process in the ambidextrous organization. The methodology of an empirical study is outlined and the results of the ensuing analyses are presented. Finally, a discussion of the findings and their implications are offered with conclusions.

Our aim is to identify essential organizational processes that explain how the ambidextrous organization can integrate current business activities and engage in responsive business initiatives at the same time. We suggest that a reasonable starting point in outlining these ambidextrous organizational processes is to consider the resource-committing decisions that guide the capacity to achieve economic efficiencies and adaptability. It is argued that strategy is shaped over time when important resource commitments are made throughout the organization in combinations of intended, i.e., planned, and emergent actions (Mintzberg, 1978, 1990, 1994; Mintzberg & Waters, 1985). In accordance with this view, it has been proposed that combinations of variance-reducing strategic planning processes and variance-increasing autonomous strategy making processes provide a selection advantage in dynamic environments while maximizing the economic benefits from ongoing business activities (Burgelman, 1988, 1996, 2001, 2006).

THEORETICAL MODEL DEVELOPMENT

The theoretical model presented here is based on the premise that the simultaneous pursuit of both exploitation and exploration (ambidexterity) is conducive to organizational performance (Gibson & Birkinshaw, 2004; He & Wong, 2004). Ambidexterity is thought to be strategically viable via loosely coupled and differentiated subunits or individuals (e.g., Benner & Tushman, 2003; Tushman & O'Reilly, 1996). However, our understanding of the differential roles and consequences of these ambidextrous activities remain unclear (for a review, see Gupta et al., 2006). Although there is a clear conceptual distinction between exploitation and exploration, the dichotomy reflects a continuum of choices between these two extremes in practice. Firms are likely to seek both exploitative and exploitative benefits where too much emphasis on exploitation may lead to adoption of sub-optimal routines, while too much emphasis on exploration may lead to high costs of experimentation without realizing the benefits. Hence, according to Levinthal and March (1993, p. 105) the basic problem confronting an organization is "to engage in sufficient exploitation to ensure its current viability and, at the same time, to devote enough energy to exploration to ensure its future viability". Empirically, though, there is very little support for the ambidexterity hypothesis (see He & Wong, 2004 for a review).

Figure 1 below presents a model of integrative strategy making where centralized exploitative and decentralized explorative decision making processes are hypothesized to exert simultaneous positive influences on performance. The strategic planning processes lead to economic efficiencies by integrating operations and coordinating activities throughout the organization (e.g., Ansoff, 1984; Lorange and Vancil, 1995). Innovation expressed as new initiatives formed in participatory and dispersed decision making processes lead to economic benefits because it adapts business activities to environmental conditions (e.g., Bettis and Hitt, 1995; Teece, Pisano and Shuen, 1997). In addition, we propose that while explorative processes may lead to innovation and associated adaptive benefits, the innovative initiatives also need to be exposed to exploitative processes to gain economic efficiencies and coordination of actions.

Insert Figure 1 about here

The ambidextrous organization

The more recent literature distinguishes between *structural* and *contextual* ambidexterity (Gibson & Birkinshaw; 2004). Structural ambidexterity relates to the distribution of structural alignment and adaptation features among different sub-groups in the business entity and temporal shifts between the two foci within the same groups (Gersick, 1991, 1994; McDonough & Leifer, 1983). Hence, different parts of the organization may be focused on exploitative and explorative activities respectively, such as, the separation between manufacturing and product development. Contextual ambidexterity constitutes "the behavioral capacity to simultaneously demonstrate alignment and adaptability across an entire business unit" as the organizational context encourages and supports individuals in their efforts to heed both of these concerns (Gibson & Birkinshaw, 2004). That is, an organizational climate may capacitate employees to consider both exploitative and explorative aspects of their work activities, i.e., when they try to act in optimal ways, they also think about how to improve. This, it is argued, "is achieved by building a carefully selected set of systems and processes that collectively define a context" (Gibson & Birkinshaw, 2004). Gibson and Birkinshaw (2004) conceptualize the organizational context on the basis of Ghoshal & Bartlett's (1994) behavior framing attributes of discipline, stretch, support, and trust and show that contextual framing influences the behavioral capacity of ambidexterity. However, the attributes of organizational context do not outline the specific processes and systems that circumscribe the ambidextrous organization.

Ambidextrous organizations have established an effective interplay between the efficiency of structural alignment and the capacity to reconfigure the structure as business conditions change (Tushman & O'Reilly, 1996). When organizations evolve successfully they tend to develop structures and systems for optimal

handling of the prevailing environmental conditions but thereby establish interdependencies that create inertia and make future changes more difficult (Tushman & O'Reilly, 1996). The tight coupling between structural elements in the efficient organization is associated with punctuated change, because adaptations require more dramatic interventions, whereas a loose structural coupling is associated with incremental change (Tushman & Romanelli, 1985; Tushman & Anderson, 1986). Establishing tight coupling between structural elements to achieve optimal fit implies intervention through a central top management driven process that can integrate functional activities but it will also require a major overhaul when adaptive changes are required. Spender and Grinyer (1995, 1996) argue that this process "oversimplifies the relationship between top management and the rest of the employees" as executives are seen as the key source for the creation of "ordered context and rationality for the rest of the organization". That is, the implied model of punctuated equilibrium may reflect that too little room has been awarded for potential exploratory efforts deriving from initiatives taken by managers within the organization. Accordingly, Spender and Grinyer (1995) suggest that effective changes to an organization's interpretive system should be shared between the top management team and lower-level managers. This approach is consistent with the concept of contextual ambidexterity where an important executive task is to create an organizational context that is conducive to contemporaneous concerns for exploitation and exploration among individual actors located throughout the organization (Gibson & Birkinshaw, 2004).

Emergent strategy processes that derive from involvement and individual initiatives constitute a loosely coupled sub-system that can facilitate incremental strategic and organizational changes. In contrast, punctuated change arises as top management induced planning activities promote periodic installments of optimizing organizational structures. To accommodate the dual requirements for structural alignment and adaptability, an ambidextrous organization may combine strategic planning, aimed at integrating business activities in optimal structures, and strategic emergence, where business development derives from managerial contributions within the organization as they respond to ongoing challenges. This combination of

planning and emergence provides a viable basis for a more concrete specification of the essential organizational processes that circumscribe ambidexterity as tightly and loosely coupled conjoint sub-systems.

A high-performing organization accomplishes its primary tasks efficiently while carrying out its organization-adapting functions effectively. The ambidextrous organization is able to realize performance advantages through exploitative processes that gain efficiencies from structural alignment and explorative processes that furnish adaptation from responsive actions to changing conditions (Gibson & Birkinshaw, 2004). Hence, we contend that ambidexterity materialize through a direct process effect on economic performance and an indirect process effect on business innovation that leads to effective organizational adaptation and performance. The direct performance effect can be achieved by engaging in central planning processes that seek to optimize operational efficiencies by integrating business activities within an overarching strategic direction. The indirect effects can be achieved through decentralized processes that affect economic performance indirectly by enhancing innovation that provides the basis for effective adaptive solutions. That is, the performance effect of exploitative processes is direct whereas the performance effect of explorative processes is mediated by innovation. Moreover, we find evidence of strategic planning acting as mediator in the effective implementation of innovative strategies. Considering planning and emergence as complementary strategy making processes in the ambidextrous organization reconciles the potential dilemma between the opposing logics of economic integration and business innovation.

HYPOTHESES

Strategic planning

The planning perspective is rooted in the tradition of rationality and is depicted by a systematic approach where the strategy is conceived in advance on the basis of comprehensive analyses of the environmental conditions that surround organizational activities (Anthony, 1965; Hofer & Schendel, 1978; Porter, 1980, 1985). Strategic planning integrates the goals and action plans of different organizational sub-units and

functional areas in view of the overarching corporate mission and aspirations (Andrews, 1980; Ansoff, 1965, 1988; Hofer & Schendel, 1978). The formal planning process comprises a sequence of logical steps including development of a mission statement, long-term corporate goals, environmental analyses, strategy formulation, implementation and contingency plans, and strategic control systems (Schendel & Hofer, 1979). Hence, we define strategic planning as a set of related processes that systematically discuss mission and goals, explore the competitive environment, analyze strategic alternatives, integrate business activities, and coordinate actions across the organization. Strategic planning has a centralized focus in the sense that the rational analytical planning activities consider the strategic issues from an overall organizational perspective and therefore typically is initiated and monitored by the top management team. The planning activities can enhance integrative capabilities and functional coordination that increase economic efficiencies and effective business expansion (Ansoff, 1984; Grynier et al., 1986; Lorange & Vancil, 1995). As such, strategic planning represents the organization's analytical thinking processes aimed at gaining relevant competitive and organizational insights to rationally determine the overall strategic position of the organization (Porter, 1996). One outcome from the strategic planning activities could be reflected in the formulation of corporate policies as the means to guide organizational actions (Christensen, Andrews, Bower, Hamermesh & Porter, 1982). The planning activities do not necessarily result in resource committing decisions per se but may serve as a devise to integrate strategic actions and outline a common 'road map' for organizational activities (Andersen, 2004; Hendry, 2000).

The strategic planning process is conceived as a top management induced rational analytical approach to stipulate a future strategic path and align the organizational structure to achieve intended outcomes. The analyses that permeate the planning activities are pursued to understand environmental conditions and identify key factors that may affect the strategic position of the firm in an increasingly complex and dynamic environment (Camillus, 1986; Richards, 1986; Schendel & Hofer, 1979). This provides the basis for outlining an overarching strategic direction, integrate functional activities, and coordinate organizational actions. Thus,

strategic planning should increase organizational effectiveness and hence improve performance:

Hypothesis 1: There is a direct positive relationship between strategic planning and performance.

Innovation

An innovative organization encourages the generation of new ideas and is open to suggestions about new ways of doing things. Hence, innovation is reflected in a widespread ability to use new ideas, devices, systems, policies, programs, processes, products, and services (Damanpour, 1991; Scott & Bruce, 1994). As such, innovation can be conceived as a key driver of responsive behaviors that allow an organization to adapt its business activities towards a better match with environmental conditions. It is generally recognized that responsiveness and ability to modify and recombine resources to fulfill current market requirements is a fundamental source of competitive advantage (Bettis & Hitt, 1995; Teece, Pisano and Shuen, 1997).

The positive direct relationship between innovation and performance has been empirically verified in a number of studies and, though measured at various levels of aggregation as well as utilizing different proxies for innovation and performance, this relationship remains remarkable robust (see Lööf & Heshmati, 2006 for a review). The rationale behind organizational innovativeness showing a strong, positive influence on performance is ascribed to innovations that serve to accommodate the uncertainties (i.e., market and technological turbulence) a firm faces in its competitive environment. Organizations can cope with environmental changes and uncertainties not only by applying new technology, but also by successfully integrating technical or administrative initiatives into their organizational structure that improve the level of achievement of their goals (Damanpour & Evan, 1984). Consistently, in this investigation, innovation is considered to be responses to environmental change or means of bringing about change in an organization through introduction of new initiatives. This leads to the following hypothesis.

Hypothesis 2: There is a direct positive relationship between innovation and performance.

Participatory decision-making

Emergent strategy processes can be construed in several ways as discussed in the literature. Insightful field observations pinpoint how engagement of middle managers in major decisions, driven by conscious executive intervention, can increase organizational adaptability as the overarching strategic aims constitute fix points that allow wide adjustments to the means needed in fulfilling the strategic aspirations. This strategy making approach was described by Quinn (1977, 1980) under the heading of 'logical incrementalism'. Other studies illustrate the potential influence of lower-level managers on the strategic direction by way of selling important ideas to senior executives thereby implying an active middle management role as organizational champions that drive new business initiatives (Dutton & Ashford, 1993, Dutton, 1995; Dutton, Ashford, O'Neill, Hayes & Wierba, 1997). A number of empirical studies illustrate how the involvement of middle managers in the strategy formulation process is associated with higher (innovative) performance furnished by idea generation rather that consensus building (Floyd & Wooldridge, 1992, 1996, 1997). The ultimate approach to managerial influence on corporate strategic direction arises when relevant middle managers are involved in all major resource committing decisions in the organization.

Strategic planning is supposed to lead the way for organizational actions; however, an intended plan implies that the strategic direction must be enacted by organizational decision makers once the rational analytical planning activities are completed. That is, unless the strategic plan has outlined all actions in minute detail that disallow any deviations from the stated course, new influences can arise from the individuals that must execute the plan and bring the strategy to fruition through concrete actions. Involving lower-level managers in the associated decision processes can uncover useful ideas that lead to new innovative solutions and the judgment of middle managers is important when new actions are advanced in the organization (Jelinek & Schoonhoven, 1990). Participatory decision-making processes where managers are involved in these resource

committing decisions can advance such bottom-up influence. The resources committed in implementing decisions will affect the development of capabilities and eventually determine the strategic options available to the organization (Bower, 1982; Noda & Bower, 1996). Hence, the participation of managers, possibly chosen through internal selection based on insight and merit, ensures that more views and perspectives are considered before resources are committed (Amason, 1995; Denison, 1984, 1990). This should lead to better and more innovative decision outcomes.

Hypothesis 3: There is a positive relationship between participatory decision-making and innovation.

Dispersed decision-making

Strategic emergence has also been described as organizational contexts where managers can take actions sometimes even without the awareness of top management (Burgelman & Grove, 1996; Mintzberg, 1994). This represents a decentralized decision structure where lower-level managers can take initiatives that subsequently may become important elements of the official corporate strategy (Burgelman, 1983, 1988). The delegation of decision power can bound in authorized investment limits (Bower, 1970) or general dispersion of decision power that enables managers to engage in new initiatives (Daft, 1992; Mintzberg, 1983). Dispersed decision making captures the managers' ability to take responsive actions without prior approval from higher up in the organizational hierarchy. The implied decentralization of the decision structure can allow important strategic influences to emerge from managerial actions pursued at lower hierarchical levels (Andersen, 2004).

Strategic influences can emerge from within the organization to the extent individuals are allowed to act in response to observed environmental changes. Hence, we define dispersed decision making as an organizational context that encourages and permits responsive actions among lower-level managers without prior approval from top management. A decentralized decision structure may allow important strategic

influences to arise through the actions taken by managers at lower hierarchical levels that are closer to the actual business transactions of the organization. Accordingly, dispersed decision-making represents the autonomous and experimenting elements of the organization's strategy formation process. Dispersed decision making is characterized by the level of influence managers within the organization can exert on strategic outcomes through their ability to take initiatives that have potential strategic impact. If managers located closer to the actual business transactions are able to take new initiatives on their own, the organization can react faster and more effectively in a dynamic environment (Huber, 1990). Other things held constant, this should lead to better and more innovative solutions based on relevant information available at the decision site.

Hypothesis 4: There is a positive relationship between dispersed decision-making and innovation.

Strategic planning in the form of central top management induced processes is exposed to the development of organizational inertia as executives establish formalized organizational structures to deal with prevailing environmental complexities (Tushman & Anderson, 1985; Tushman & O'Reilly, 1996). Engaging in participatory decision making processes may serve to incorporate alternative perspectives and insights to avoid the adverse inertial effects deriving from the optimization of a given structural alignment. The associated innovative capacity may be further enhanced by the ability of dispersed decision makers to take responsive actions and explore alternative actions through experimentation in trial and error learning. However, these individual decision makers are exposed to bounded rationality, i.e., they have limited mental capacities and are incapable of knowing everything of potential relevance (Simon, 1959; Cyert & March, 1992). Hence, it is pertinent to take knowledge residing in other parts of the organization into account when dispersed actions are considered in the corporate strategy development. Specific knowledge is difficult and costly to transfer across the organization in formalized information systems (Jensen & Meckling, 1995) but strategic planning processes provide for efficient integration of such information. That is, the distributed decision rights to lower-level managers in the dispersed decision making processes may generate control

problems and impose agency costs due to potential influences of self-interest (Eisenhardt, 1989). To circumvent this, the opportunistic initiatives deriving from the actions of dispersed decision makers must be exposed to central, integrating, and aligning processes, such as strategic planning (Jensen & Meckling, 1995). This should lead to more effective execution of new innovative initiatives. Empirical evidence supports this view of strategy as a process that involves two recognizably different yet interdependent phases (Bradach, 1998; Schultz and Yang, 1997). The first is a phase of exploration in which the business model is created and refined. The second is a phase of exploitation in which the business model is stabilized and leveraged through large-scale replication. Since profit goals (in present value terms) sometimes conflict with long-term survival goals, it is particularly important to view exploration and exploitation as integrative parts of organizational performance. Thus:

Hypothesis 5: The positive relationship between innovation and performance is mediated by strategic planning.

METHODS

The hypotheses were tested using structural equation modeling (EQS version 6.1) to assess the relationships between predictor, mediating, and outcome variables. Analyzing the hypothesized relationships simultaneously results in more accurate estimates of relations among constructs and avoids biases associated with single-indicator models (James, Mulaik & Brett, 1982). Using structural equations allows for testing of a factor structure, adjustment for measurement error, examination of relationships among predictor variables, and the simultaneous estimation of all parameters in the model (cf. Bollen & Long, 1993). Moreover, structural equation modeling allows consideration of competing models and evaluation of alternative model relationships (James, Mulaik & Brett, 1982).

We followed the two-stage structural modeling approach suggested by Anderson and Gerbing (1988) by testing measurement and structural models sequentially. This two-stage approach allowed us to assess construct validity (stage 1) in the measurement model separately from the adequacy of the proposed theory

(stage 2) in the structural model (Bollen, 1989). Thus, the likelihood of interpretational confounds is reduced because the validity of the constructs is established prior to investigating hypothesized relations.

Sample

To investigate the hypothesized model relationships the study sampled single business entities operating in various manufacturing industries among firms registered in the Compustat database. These industries spanned a diversity of environmental settings comprising meat packing, sugar products, beverages, apparel, furniture, machinery, computers, calculators, instruments, etc. Annual reports from firms listed within the identified industries were analyzed to ensure that the sample consisted of single business firms and corporate business units. Entities that had gone through major reorganizations within a five-year time span were excluded from the sample to ensure that model constructs could be associated with performance outcomes for this period. The initial analysis identified 360 business entities where questionnaires were mailed to the executive responsible for sales and marketing. These executives were targeted as prime respondents because market considerations constitute a central aspect of strategy (Porter, 1996) and market-oriented executives typically are engaged in the strategy process (Floyd & Wooldridge, 1992; Mintzberg, 1994). The responding executives on average had 6.5 managers reporting to them within a range of 2-34 managers. Initial mailings were complemented by soliciting phone calls by a senior researcher and a second mailing of the questionnaire to non-respondents.

The solicited executives returned 185 useable questionnaires corresponding to a response rate of 51.4%, which compares favorably to similar executive-based studies (Hambrick, Geletkanycz & Fredrickson, 1993). Approximately two-thirds of the responses were received within a month from the initial mailing. The sample was tested for non-response biases, differences between early and late responses, and between single business firms and corporate business units. No significant differences in total assets, net sales, sales growth, return on assets, and profit margin were identified. The self-assessed performance measures were validated by

correlating the subjective performance indicators of sales growth and profitability with archival data from Compustat. This analysis showed a correlation coefficient of 0.38 between the growth measures and 0.30 between the profitability measures based on the full sample. The same comparisons performed on the 117 single-business firms in the sample, the correlation coefficients increased to 0.42 and 0.49 respectively[1]. These results are comparable to the standard derived in similar studies (Dess and Robinson, 1984).

The decision makers relevant for this study reside below the executive level and as such constitute lower level managers in the organization. The reliability of the prime respondents (executives) was tested by comparing to responses from lower level managers selected randomly among the first 123 responding business entities. Secondary respondents were solicited from 18 of these entities (15% of the early respondents) with an average of 7.4 managers responding in each of these entities. The average inter-rater reliability between respondents was calculated at 0.70 based on the performance indicators, which is deemed satisfactory (Nunnally and Bernstein, 1994).

Measures

This section describes the measures we used in testing the final model. Although additional measures were included in the initial measurement model, these measures failed to exhibit convergent validity and thus were eliminated from the model.

Strategic planning reflects the organization's emphasis on the rational analytical elements of the strategic management process captured by items initially developed and tested by Boyd & Reuning-Elliott (1998). Participatory decision-making reflects the extent to which managers are involved in the organization's strategic decision-making processes. *Distributed decision-making* reflects the extent to which managers are

[1] This is to be expected because the archival data reflect corporate performance comprising all business activities and, therefore, the self-assessed and archival performance measures should indicate closer correspondence between

authorized to take initiatives without prior top management approval. Both participatory and distributed decision-making reflect dimensions identified in Aiken and Hage's centralization measure (Price, 1972). The items used to measure the two constructs were modified to incorporate strategic issues, such as new market activities, product and service developments, changing practices and policies (Miller, 1987). *Innovation* reflects the extent to which the organization is able to change the way things are done and generate suggestions to do things differently (Damanpour, 1991; Scott & Bruce, 1994). *Performance* was captured by market expansion and economic returns and measured by self-assessed indicators of annual sales growth and return on assets compared to close competitors (Dess & Robinson, 1984). All items were assessed on five-point Likert scales and the measures were calculated by aggregating the item responses. Descriptive statistics on the measures and underlying items used to measure the model constructs are presented in Table 1 below. The correlation analysis between model constructs show initial evidence of good convergent and discriminant validity. All item responses were exposed to factor analysis, which confirmed the distinct constructs of strategic planning, participatory decision-making, distributed decision-making, innovation, and performance.

Insert Table 1 about here

RESULTS

Stage 1 – Measurement model

The results of the confirmatory factor analysis (stage 1) provided support for the proposed model in Figure 1. All items loaded on their predicted factors with values of 0.6 or better. The results supported the convergent validity of the measurement model as all freely estimated parameters had significant and high factor loadings. In support of the discriminant validity of the conceptualized model, the multivariate Lagrange-Multiplier (LM) tests of the modification index suggested no cross-factor loadings. An overall test of convergent validity

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among single business firms.

was provided by the CFI, which estimates the percentage of variation explained by a proposed model relative to a model of complete independence. Values may range from 0 to 1 where a value of 0.90 signifies that 90% more variance is explained by the measurement model than the null model. Hence, values of 0.90 or better indicate a model with a good fit (Bentler, 2005; 1989) whereas values below 0.90 indicate that the model can be improved (Byrne, 2006; Bentler, 2005). The goodness-of-fit indices for the saturated measurement model (model I) reflected a model with good fit characteristics ($P\chi^2$ = 186.957, NNFI = 0.948, CFI = 0.958, RMSEA = 0.045). Based on the degrees of freedom (137), the significance of the $P\chi^2$ statistics is good. However, the sensitivity of $P\chi^2$ statistics to sample size has been extensively criticized (Byrne, 2006; Kline, 2005) and a number of alternative fit indices are proposed. A value of 0.95 on the comparative fit index (CFI) is considered strong evidence of practical significance. Moreover, the Root Mean Square Error of Approximation (RMSEA), which is sensitive to model complexity, provides further evidence of a good model fit with values below 0.05 indicating a very good model fit whereas values lower than 0.08 are acceptable and values between 0.08 and 0.10 are considered to indicate a weaker model fit (Byrne, 2006).

Stage 2 – Structural model

The structural model is used to assess the validity of causal structures among latent variables. By comparing a series of nested and theoretically competing models, the hypothesized causal relationships between variables can be tested. The theoretical reasoning and the sequence of testing the measurement models was as follows (see all measurement models in Figure 2).

Insert Figure 2 about here

The Root Mean Square Error of Approximation (RMSEA) estimation was used in addition to the CFI and chi-square for assessing model fit. Incremental fit indices (such as CFI) may favor complex models over more

parsimonious models since the contribution to model fit from each additional parameter is not taken into consideration (Mulaik *et al.,* 1989). The RMSEA, in contrast, considers the error of approximation in the population and measures the fit of the model based on the discrepancy between the "optimal" fit if it was available and the actual fit. Hence the RMSEA is sensitive to the number of estimated parameters in the model with values below 0.05 indicating a good fit. According to Hu & Bentler (1998) and MacCallum & Austin (2000), use of RMSEA is strongly recommended because (a) it is adequately sensitive to model misspecification, (b) interpretative guidelines yield appropriate conclusions regarding model quality, and (c) it is possible to build confidence intervals around RMSEA values[3]. Table 2 provides the fit indices for the measurement models.

Insert Table 2

According to conventional reasoning (Ansoff, 1984; Grynier et al., 1986; Lorange & Vancil, 1995) strategic planning enhances operational integration and functional coordination that increases economic efficiencies and effective business expansion – exploitation. Hence, the base model tested for direct independent effects of strategic planning on performance (Model II). Model II did a reasonable job of reproducing the sample covariance matrix as indicated by a CFI of 0.945. This model obtained a RMSEA of 0.050 indicating that fit was achieved without the expense of unnecessary constructs. Next, we contrasted this model (Model II) with a sequence of potentially better nested alternative models based on theoretical reasoning to avoid data 'exploring' (Hoyle & Panter, 1995). Hence, we first compared the proposed structural model with the fully saturated measurement model (Model I) postulating relationships between all the model constructs. Removal of six paths from the saturated model appears to have harmed the model as Model II shows a reduction in CFI (ΔCFI = -0.013) and an increase in RMSEA (ΔRMSEA = +0.005) and chi-square ($\Delta\chi^2_{5df}$ = +21.27, $p < 0.001$).

[3] EQS reports a 90% interval around the RMSEA value.

The deterioration in model fit indicates that there is some misspecification in the theoretical model (Model II) and that additional paths may be important to overall model fit.

Theoretical arguments, however, also suggest that strategic planning processes encourage adaptive strategic thinking and thus can generate new ideas and innovative solutions – exploration (Ansoff, 1988, 1991; Lorange & Vancil, 1995; Miller and Cardinal, 1994). Consequently, we included a path from strategic planning to innovation to test the indirect effects of strategic planning on performance, mediated through innovation (Model III). The results indicated an improvement in fit over the base line structural model (ΔCFI = +0.007, ΔRMSEA = -0.003, $\Delta\chi^2_1$df = -5.68, $p < 0.001$). This suggests that adding a path between strategic planning and innovation provides a substantive improvement over our proposed base line model even when testing for sensitivity to complexity. Moreover, this model (Model III) is preferred over the saturated measurement model (Model I) because it is more parsimonious and only marginally inferior (ΔCFI = -0.006, ΔRMSEA = +0.002, $\Delta\chi^2_4$df = +15.59, $p < 0.001$).

Finally, we considered the reverse relationship between strategic planning and innovation based on the theoretical argument that innovative initiatives must be aligned with strategic planning activities to maintain economic efficiencies and avoid excessive agency and knowledge transfer costs (Ansoff, 1988; Eisenhardt, 1989; Jensen & Meckling, 1995). Thus, we regarded the simultaneous pursuit of exploitation and exploration in the ambidextrous organization to be an integrative process of decentralized explorative influences on performance, mediated by innovation, which in turn is influencing performance partially through better adaptation and partially through central exploitative processes (Model IV). Results of this test indicated a further improvement in model fit over both the base line model (Model II) (ΔCFI = +0.009, ΔRMSEA = -0.005, $\Delta\chi^2_1$df = -13.97, $p < 0.001$) and the model with the path leading from strategic planning to innovation (Model III) (ΔCFI = +0.004, ΔRMSEA = -0.002, $\Delta\chi^2_0$df = -8.29, $p < 0.001$). Hence, we find support for the path-dependent relationship from innovation to strategic planning.

Hypotheses testing

Using the structural model with the best fit (Model IV) identified in the nested model tests, we proceed to examine the hypotheses through the parameter estimates. Figure 3 shows the parameter estimates generated by those tests. All path coefficients represent standardized estimates. Mardia's normalized kurtosis estimate was determined as 3.15, which suggests that the data are normally distributed with values above 5.00 indicating non-normality in the sample (Bentler, 2005).

Insert Figure 3 about here

Table 3 below presents results for the final structural model (Model IV). For purposes of direct comparison, we also present parallel results for the 'next best' model (Model III), since this model represents an alternative model to the hypothesized relationship between strategic planning and innovation. Hypotheses 1 tests the direct relationship between strategic planning and performance. The anticipated positive effect (H1) was supported ($\gamma = +0.381$; $p > 0.05$). Similarly, the positive relation between innovation and performance (H2) received strong support ($\gamma = +0.613$; $p > 0.01$). In testing the relationships between participatory (H3) and dispersed (H4) decision-making and innovation both paths were significant and in the anticipated direction ($\gamma = +0.456$; $p > 0.01$ and $\gamma = +0.413$; $p > 0.01$ respectively). Finally, the hypothesized relationship between innovation and strategic planning (H5) received support in both models, however, with a stronger and more significant effect ($\gamma = +0.479$; $p > 0.01$) from innovation to strategic planning (Model IV) as opposed to the reverse relationship ($\gamma = +0.199$; $p > 0.10$) as indicated in Model III. Structural equation modeling is not an analytical method to test causality (Kline, 2005) but allows testing of alternative models that predict different causal relationships and evaluate parameter significance and overall model fit. In sum, the hypothesized relationships were supported and comparison between models III and IV indicated that none of them fits the data better than model IV.

Insert Table 3 about here

Methodological considerations

We controlled for potential industry effects by conducting a post-hoc analysis, testing for invariance of common structural paths across industry groups. We started by dividing our sample according to 'dynamism' in industries under the assumption that strategic decision-making and innovation processes may be affected by the level of environmental change as suggested by management researchers and organization theorists alike (Bourgeois & Eisenhardt, 1988; Dess & Beard, 1984; Mintzberg, 1973, 1983; Perrow, 1966; Thompson, 1966). This yielded two clear industry groups; one with relatively high levels of dynamism (computer products) and one with relatively low levels of dynamism (household goods). Next, following Byrne (2005) we tested for equivalence across industry groups related to structural regression paths by applying a multigroup analysis. This method allows for simultaneous estimation of parameters for both groups. The results (not reported here but available upon request) showed evidence of invariance across the two industry groups based on the probability of increment change in $P\chi^2$ being higher than 0.05, which means that if the constraints for equality between groups are released, this will not lead to significant change in the $P\chi^2$ statistics. Hence, we are confident that our results are robust across industries with different levels of dynamism. However, future research may attempt to include more fine-grained industry variables in order to tease out potential industry-specific variations.

As noted by many scholars (e.g., Tanaka, 1993), post hoc model-fitting in the analysis of covariance structures is problematic due to the increased risk of committing type I or type II errors that cannot be detected or controlled for at this point. Thus, model modifications may be driven by characteristics of the particular sample on which the model was tested (e.g., sample size, sample heterogeneity). Although

desirable, sample size and data availability did not allow for cross-validation analysis on a second (independent) sample from the same population.

DISCUSSION

The analyses of the proposed structural equation models show that strategic planning has a direct positive performance relationship, which indicates that economic efficiencies can be gained through the integration of business activities and coordination of organizational actions through engagement in various planning efforts. Hence, the strategic planning processes conducted in concert with a rational analytical approach to strategic management can be conceived as an exploitative sub-system of the integrative strategy making process in the ambidextrous organization that creates value by optimizing economic efficiencies in an aligned organization.

Participatory decision-making has a direct positive association with behaviors that lead to the development of innovative initiatives within the organization. By involving key managers and functional specialists in strategic decisions, the organization can ensure that relevant information and alternative perspectives are considered in decision evaluations. Similarly, dispersed strategic decision-making, where decision power is distributed to lower level managers, underpins the emergence of responsive autonomous actions that can develop potentially useful strategic initiatives. This constitutes a type of trial and error learning as managers at dispersed decision nodes take responsive actions in view of changes in the business environment. It resembles decentralized exploration processes in the form of efficient low-risk strategy probing based on active search (Sitkin, 1992; Brown and Eisenhardt, 1997). The engagement in effective participatory and dispersed decision-making processes can be conceived as basic mechanisms that drive dynamic capabilities and enable innovation and strategic renewal in the organization (Teece, Pisano & Shuen, 1997; Helfat & Peteraf, 2003; Helfat & Raubitscheck, 2000). Together, these two emergent strategy making processes take the form of a decentralized, explorative sub-system in the integrative strategy making model of the ambidextrous organization, creating value through development of innovative adaptive solutions.

The preceding analyses illustrate how the ambidextrous organization can be conceived in the context of an integrative strategy making model that incorporates an exploitative sub-system, driven by strategic planning processes, and an explorative sub-system, formed by participatory and dispersed decision-making processes. The exploitative sub-system gains economic efficiencies through operational integration and coordination of activities within an aligned organization, whereas the explorative sub-system ensures that business activities are adapted to changing environmental conditions. The explorative sub-system creates value directly by enabling the introduction of effective strategic responses that match new requirements evolving in a dynamic environment. The effectiveness derives from delegating decision power to lower-level decision nodes that are closer to the actual business transactions and are better informed about relevant environmental details. This means that managers can take faster responsive actions by eliminating cumbersome hierarchical approval processes. It can also reduce information processing and communication costs while leading to more informed quality decisions (Huber, 1990). However, strategic planning can increase the effectiveness of responsive actions by integrating them into an existing operational structure and coordinating new actions with current organizational activities in ways that improve economic efficiencies. Hence, the combination of exploitative and explorative sub-systems fulfills the criteria for the ambidextrous organization, which calls for optimal organizational alignment and effective adaptive capabilities at the same time (Gibson & Birkinshaw, 2004; Tushman & O'Reilly, 1996).

It has been argued that planning activities can create a better understanding of the business environment and the organization's competitive situation and thereby enhance the identification of new business opportunities. Hence, the strategic planning processes may encourage adaptive strategic thinking and facilitate the generation of new ideas and actions that could be useful in dynamic environments (Ansoff, 1988, 1991; Lorange and Vancil, 1977; Miller and Cardinal, 1994). However, we do not identify this as the dominant feature in the integrative strategy making model of the ambidextrous organization. Instead, we find the

performance effect of innovative initiatives to be partially mediated by planning activities possibly through better timing of expansion plans, improved coordination of actions with other organizational sub-units, and integration of business activities that leads to a more efficient operational alignment. Whereas a conventional interpretation emphasizes formulation of corporate policies as the means to guide strategic actions (Christensen *et al.*, 1982), it seems the integrating and coordinating element of planning overshadows the inspirational and directive elements. The results illustrate the existence of two independent sub-systems that influence economic efficiency and effective adaptation respectively but also show interdependence between the two sub-systems as the performance effect of innovation is partially mediated by strategic planning. Furthermore, the empirical analyses show the significance of the integrative strategy making model of the ambidextrous organization that combine strategic planning, participatory, and dispersed decision-making processes in combined exploitative and explorative sub-systems. Hence, the study extends the results of previous empirical studies (Gibson & Birkinshaw, 2004; He & Wong, 2004) and provides new insights into processes and systems that seem to constitute the backbone of effective ambidextrous organizations and thereby

While we outline the contours of a plausible ambidextrous organization driven by simultaneous exploitative and explorative sub-systems, we do not find unequivocal and clear interrelationships between the central strategic planning processes and the decentralized decision-making processes of involvement and experimentation. The analyses identify a direct performance effect of innovation but also find that performance outcomes are substantially mediated by strategic planning. Consistent with previous studies (He & Wong, 2004), our results point to a need for further investigations of the potential interactions between the exploitative and explorative sub-systems. Future investigations may also consider interaction effects between hierarchical levels that may be necessary to identify important 'strategic inflection points' as suggested by Burgelman and Grove (1996). While these concerns relate to the more detailed mechanics between interacting exploitative and explorative sub-systems in the ambidextrous organization, the existence of rather separate

central and decentralized sub-systems illustrates that organizational context do seem important to facilitate ambidexterity. In other words, it takes top management commitment to organize ambidextrous processes and create an organizational context that provides the necessary impetuous to drive the simultaneous exploitative and explorative sub-systems (Gibson & Birkinshaw, 2004). The conditions for ambidexterity are not likely to happen without executive focus and, therefore, these results also point to a need for more complementary analyses of the necessary antecedents for effective ambidexterity.

CONCLUSIONS AND LIMITATIONS

The current study extends our understanding of the effective ambidextrous organization as combinations of central exploitative processes and decentralized explorative processes in an integrative strategy making process. This is consistent with the observation that central integrating processes play an important role in the post-bureaucratic organization (Hill, Martin & Harris, 2000) while decentralization and autonomy, the central characteristic of the post-bureaucratic organization, matter at the same time. Here they constitute coexisting elements of an integrative strategy making model of the ambidextrous organization thereby confirming previous research suggestions that different strategy making approaches may be combined in effective strategy formation (Hart, 1992; Hendry, 2000, Mintzberg, 1978; Mintzberg & Waters, 1985).

This study contains some practical constraints that may limit the interpretation of the results but also provide opportunities for future research. First, the self-assessed economic performance measure depicts performance relative to close competitors and hence by design eliminates industry specific effects, such as munificence, product differentiability, advertising intensity, etc. Performance was assessed on these comparable scales to avoid distorting influences from systematic differences in industry profitability (Porter, 1980; Rumelt, 1991). While we did cross-validate the self-assessed performance measure with secondary performance data from financial statements, we did not include these measures in our analyses because they constituted corporate as opposed to business unit financials. However, future research might benefit from utilizing combinations of

subjective and objective performance measures in a multidimensional design in order to further investigate the outcome effects of ambidexterity.

Innovation was measured as the proclivity of employees to suggest and initiate new ideas. While this measure captures the general innovative decision making behavior, it does not specify the domain of these initiatives. In organizational innovation literature, the distinction between 'technical' innovations and 'administrative' innovation is often made to emphasize the difference between direct (products, services or production process technology) and indirect (organizational structure and administrative processes) improvements in basic work activities (Damanpour, 1991). It may be beneficial to adopt measures that capture this distinction in order to further investigate the multi-directional relationship between innovation and strategic planning in future studies.

The focus on strategic planning, participatory, and dispersed decision-making processes is derived from the extant strategic management literature but might not consider all the possible influences that could derive from other strategy making approaches, e.g., autocratic command, visionary leadership, project organizations, etc. (Hart, 1992; Hart & Banbury, 1994; Nonaka, 1988, Mintzberg, 1973). The study is based on business entities operating in diverse manufacturing industries with different levels of dynamism, but the study is limited to manufacturing organizations and do not consider pure trading or services environments, i.e., there may be a need to extend the industry focus in future research. Yet, the analysis of a diverse set of US-based manufacturing organizations extends our base of empirical studies together with Gibson & Birkinshaw's (2004) focus on business units in 10 multinational corporations and He & Wong's (2004) consideration of innovation strategies in Asian companies and together they add to the robustness of the underlying conceptual framework. The current study of single business entities complement our empirical insights about the ambidextrous organizations by providing a particular focus on essential processes and systems that drive ambidexterity. All the studies reach complementary and positive results that seem to confirm the underlying

thesis that the formation of an ambidextrous organization is essential to retain competitive advantage and gain superior performance outcomes.

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Figure 1. Integrative Strategy Making Model of Exploitative and Explorative Sub-Systems

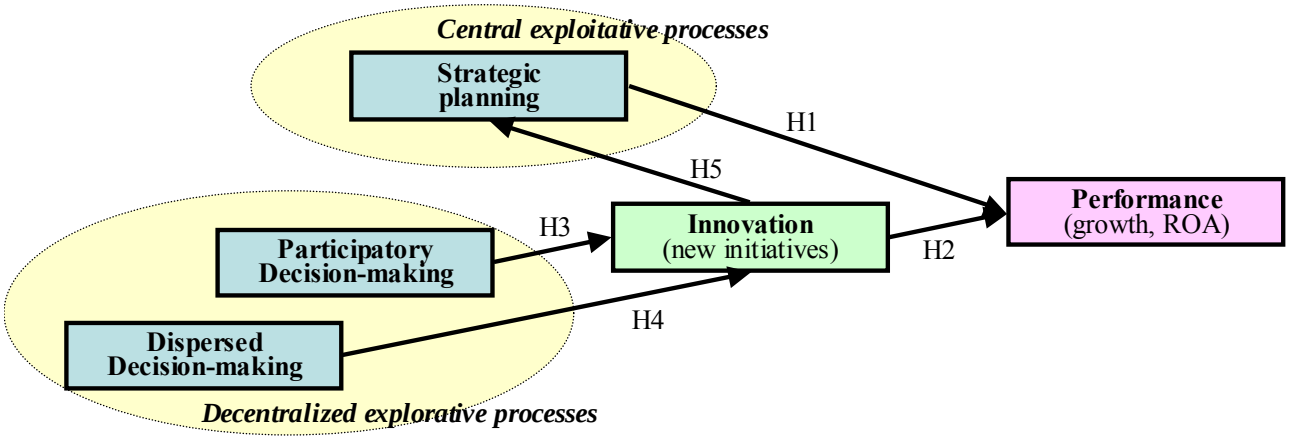
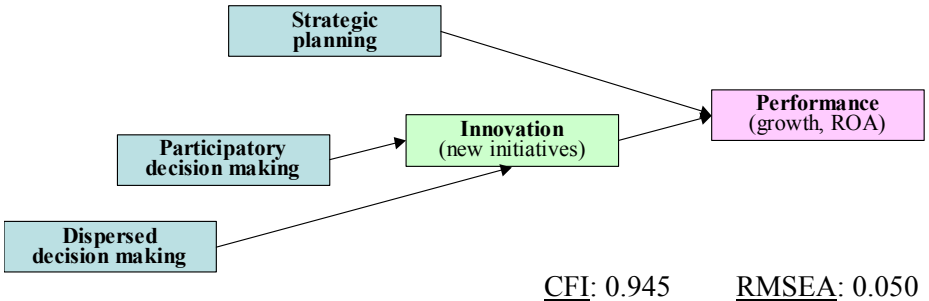


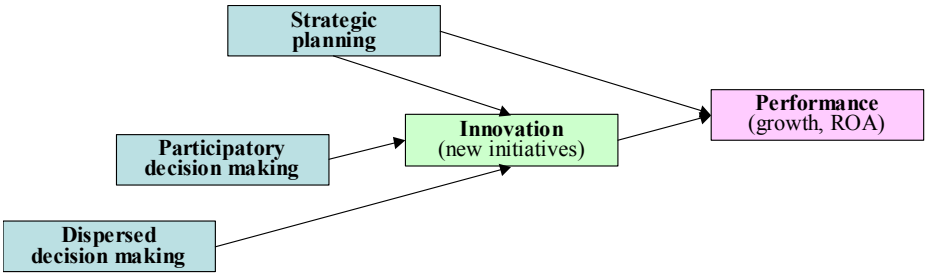
Figure 2. Alternative Structural Equation Models

Model II:



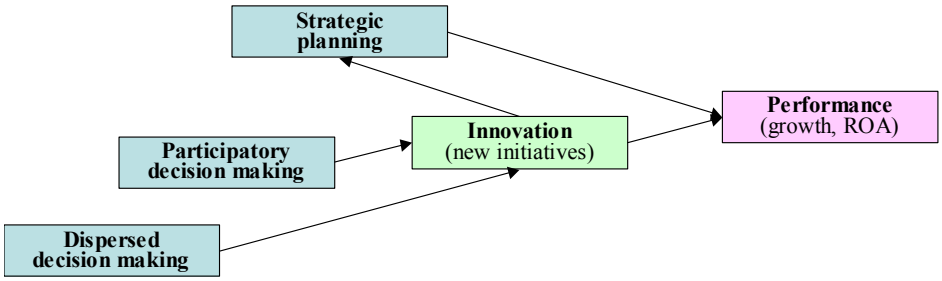
CFI: 0.945 RMSEA: 0.050

Model III:



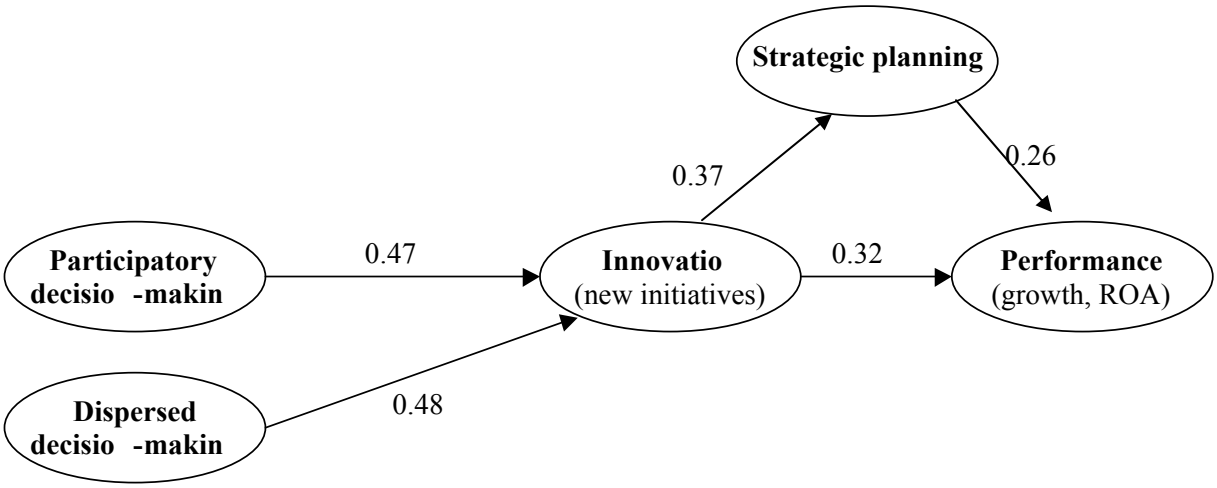
CFI: 0.952 RMSEA: 0.047

Model IV:



CFI: 0.956 RMSEA: 0.045

Figure 3. Covariance structure analysis – final structural model (Model IV)



Asterisks depict significant standardized parameter estimates at the $p < 0.05$ level.

Disturbance and measurement error effects are omitted for clarity.

Table 1. Descriptive Statistics and Correlation Analysis

	Mean	S.D.	Alpha	Items
Strategic planning	17.55	4.78	0.84	The organization puts emphasis on: - development of a mission statement - long-term plans - annual goals - short-term action plans - evaluation of strategic objectives
[1=no emphasis; 5=strong emphasis]				
Disbursed decision making	13.36	2.04	0.70	Managers below the top management team: - can start major market activities without approval - can market to new customer segments without approval - need no approval to initiate new product developments - can introduce new practices without approval - need no approval to develop new internal capabilities
[1=definitely false; 5=definitely true]				
Participatory decision making	19.40	3.36	0.85	Managers participate in decisions: - to change the firm's market position - about moves into new customer segments - about major product/service introductions - about development of important capabilities - to adapt new policies and practices
[1=never; 5=always]				
Innovation	11.55	2.78	0.81	The organization is characterized by: - frequent changes to the way work is done - numerous suggestions to do things differently
[1=definitely false; 5=definitely true]				
Performance	11.55	2.78	0.91	Organization's position compared to close competitors: - annual growth in sales - profitability (return on assets)
[1=lowest 20 percent; 5=highest 20 percent]				

Correlation coefficients

	1	2	3	4
1. Strategic planning				
2. Participatory decision making	0.18*			
3. Disbursed decision making	0.11	0.14+		
4. Innovation	0.04	0.18*	0.23**	
5. Performance	0.04	0.18*	0.23**	0.64**

+ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$

Table 2. Fit Indices for Nested Sequence of Structural Models

Nr.	Model	CFI	ΔCFI	RMSEA[a]	ΔRMSEA	χ^2_{df}; P[b]	$\Delta\chi^2_{\Delta df}$; P
I	Measurement model	0.958		0.045		186.96_{137}; p< 0.003	
II	Base line model	0.945		0.050		208.23_{143}; p< 0.0003	
	Model II-I difference		- 0.013		+0.005		$+21.27_{6}$; p< 0.005
III	SP → Innovation path	0.952		0.047		202.55_{142}; p< 0.0006	
	Model III-II difference		+0.007		-0.003		-5.68_{1}; p< 0.001
	Model III-I difference		-0.006		+0.002		$+15.59_{5}$; p< 0.001
IV	Innovation→ SP path	0.956		0.045		194.26_{142}; p< 0.002	
	Model IV-II difference		+0.009		-0.005		-13.97_{1}; p< 0.001
	Model IV-III difference		+0.004		-0.002		-8.29_{0}; p< 0.001

[a] Values reported are the upper bound of the 90% interval and hence a conservative estimate; [b] Probabilities are stated in inequality terms as chi-square tables are sparse.

Table 3. Structural Equation Modeling Results – Hypothesis Tests for Theoretical and Final Models

Hyp.	Description of path	Hypothesized direction	Model III		Model IV	
			Path Coefficient	Z	Path Coefficient	Z
1	Strategic Planning → Performance	+	0.367	2.436	0.381	2.431
2	Innovation → Performance	+	0.654	2.706	0.613	2.578
3	Participatory Decision Making → Innovation	+	0.397	3.711	0.456	4.138
4	Dispersed Decision Making → Innovation	+	0.403	3.595	0.413	3.676
5	Innovation → Strategic Planning	+			0.479	3.074
Alt. Path[a]	Strategic Planning → Innovation	+	0.199	2.418		

[a] This path was hypothesized in Model III and represents the difference between Model III and Model IV.
N = 185, all path coefficients are non-standardized estimates, significant at the $p < 0.05$ level.

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