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Inconclusive Innovation "Returns": A Meta-Analysis of Research on Innovation in New Product Development*

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This research on studies that have empirically examined the construct innovation provides a meta-analysis of the marketing, management, and new product literatures. The study extends previous meta-analytic works by drawing on 70 independent samples from 64 studies (published from 1970 to 2006) with a total sample size of 12,921. The overall objective is to propose a synthesized model that includes technological turbulence, market turbulence, customer orientation, competitor orientation, organizational structure, innovation, and new product performance. Six baseline hypotheses were developed and tested. The goal is not only to derive empirical generalizations from these literatures but also to investigate sources of inconsistencies in the findings. Four substantive and two methodological artifacts were tested to determine whether they moderate model relationships (i.e., whether the effect sizes differ for any of the six baseline hypotheses). The potential moderators were project versus program level of analysis, the nature of change required by the innovation, service versus product, country of the data's origin, continuous versus categorical measurement, and the number of scales used. From a theoretical perspective, the results corroborated the resource-based view framework regarding the determinants and the performance outcome of innovation. New product performance (the performance outcome) is a direct consequence of innovation, and this effect is stronger when the data are collected from Western countries. This relationship holds regardless of whether the level of analysis is the new product program versus project or whether the innovation is a product or a service, a robust result relevant to researchers and managers alike. As for the determinants of innovation, the results were as follows. While market turbulence is overall not a direct antecedent to innovation, technological turbulence is overall positively related (especially when market discontinuities are considered or when the data are collected from Asian countries). Customer orientation encourages new product innovation overall, but especially at the program (as opposed to project) level in Western countries. The effect of competitor orientation is also positive. The results for either orientation construct or either turbulence construct held whether the level of analysis was project versus program or whether services versus products were examined. However, the relationship of mechanistic organizational structures to innovation, although positive in the overall sample, did vary by product (positive) versus service (negative).

Introduction

Innovation in new product development (NPD) is addressed by many studies in the marketing, management, and new product literatures. Deriving substantive conclusions from this research acquires urgency in the face of escalating uncertainty and the increased rates of product innovation required to survive (e.g., Kotabe and Swan, 1995). However, researchers obtain different results due to the difficulty of controlling research environments, the lack of common definitions, and the variety of methods and settings employed (Hedges and Olkin, 1982).

Research results can be contradictory. For instance, some scholars advocate radically innovative, highly differentiated products to provide firms with sustainable competitive advantages (Langerak and Hultink, 2006). Other studies claim that less innovative products entail less market uncertainty and more synergy with existing firm resources and capabilities and thus are more likely to succeed (Cooper and Kleinschmidt, 1987; Song and Parry, 1996). Some scholars support a customer orientation (Day, 1994; Lukas and Ferrell, 2000), whereas others argue that reliance on customer input leads to reactive strategies and only incrementally innovative products (Atuahene-Gima, 2005; Atuahene-Gima, Slater, and Olson, 2005; Baker and Sinkula, 2005). Finally, the role of organizational structure is controversial: the dominant view advocates flexible

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organic structures (Gupta and Wilemon, 1986), but some scholars point to the temporal efficiency and cost-effectiveness of mechanistic structures that are formalized and centralized (McDermott and O'Connor, 2002; Olson, Walker, and Ruekert, 1995).

Overall, the literature on product innovation would benefit from a meta-analytic synthesis, which permits retesting of linkages with cumulative data to unveil overall tendencies (Vismesvaran and Ones, 1995) and examines the grounds for inconsistencies and the impact on effect sizes (Hunter and Schmidt, 1990; Rosenthal, 1991). Other meta-analyses, primarily of new product success factors, have been performed in the past; examples include Montoya-Weiss and Calantone (1994), who examined 18 determinants of new product success, and Henard and Szymanski (2001), who examined study measurement and sample artifacts. The current research extends these works and contributes to the NPD literature by providing a meta-analysis of marketing, management and new product studies (1970–2006) that have examined innovation along with antecedents (e.g., customer orientation) or outcomes (performance).

The model includes technological and market turbulences, customer and competitor orientations, organizational structure, new product innovation, and new product performance. The primary concerns are relationship robustness and the specification of conditions that limit generalizability. Disparate results may be due to methodological or substantive moderators (or "artifacts" in Hunter and Schmidt, 1990). The moderators examined are (1) level of analysis, (project–product level vs. the small business unit [SBU]–program level; Johne and Snelson, 1988); (2) the nature of change required by the innovation (internal changes in the firm's technology and practices vs. external, or leaps in the customers' behavior and thinking); (3) product versus service; (4) country of the data's origin (Gatignon and Anderson, 1988); (5) the level of measurement; and (6) the number of scales used. The first four are substantive moderators, whereas the latter two are methodological moderators. Methodologically, the operationalization of innovation is often unidimensional and categorical, particularly in the earlier literature (Danneels and Kleinschmidt, 2001; Garcia and Calantone, 2002), but Green, Gavin, and Aiman-Smith (1995) and others argue that it should be a continuum with multiple dimensions.

The discussion begins with a theoretical overview, descriptions of the moderators, and then develops the key hypotheses. Next the methodology is described, including both the bivariate and the multivariate analyses performed. Finally, the results are discussed.

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Model Overview and Potential Moderators

Theoretical Overview

Innovation comprises the development, production, and market commercialization of an invention as well as product diffusion and adoption by customers (Garcia and Calantone, 2002). The theoretical model and subsequent meta-analysis are rooted in the resource-based theory (RBV), which maintains that resources (rare, nonimitable, and nonsubstitutable) and capabilities are the enduring sources of competitive advantage (Day, 1994; Penrose, 1959; Peteraf, 1993). New product innovation can be viewed as a distinctive capability (Mahoney and Pandian, 1993): firms creating superior, unique, and novel products should enjoy competitive advantage (Gatignon and Xuereb, 1997).

As Penrose (1959, p. 54) suggested, a firm's distinctive competence may lie in making better use of resources rather than having more resources. NPD studies within the RBV framework thus focus on the influence of strategies, structures, and processes (Gatignon and Xuereb, 1997; Gupta and Wilemon,

1986; Hurley and Hult, 1998). Accordingly, this research examines five antecedents of new product innovation (H1: market and H2: technological turbulences; H3: customer and H4: competitor orientations; and H5: organizational structure) and one consequence (H6: new product performance). The baseline hypotheses (H1–H6) and those concerning six potential moderators (labeled H1a–Hf through H6a–Hf) are developed herein. They are summarized in Table 3, column 3 (along with the results). The six potential moderators of model relationships were identified from an initial review of 134 papers published in 12 peer-reviewed journals from 1970 to 2006 (see "Methodology").

Level of Analysis (Product–Project vs. Program–SBU): A Potential Substantive Moderator

Studies at the product–project level conceptualized new product innovation as an iterative process initiated by the perception of opportunity, which leads to development, production, and marketing tasks (Garcia and Calantone, 2002). This research examines activities needed to design, produce, and deliver a new product (e.g., NPD management) as well as product–project characteristics such as the degree of customization (Bonner, Reukert, and Walker, 2002; Kessler and Chakrabarti, 1999; Sethi et al., 2001; Song and Montoya-Weiss, 1998; Veryzer, 1998). On the other hand, at the SBU or program level, innovation is broadly viewed as "a means of changing an organization" (Damanpour, 1991, p. 556). This encompasses both actions taken and the stance of the firm (Calantone, Di Benedetto, and Bhoovaraghavan, 1994; Droge, Calantone, and Harmancioglu, 2008); for example, studies are about the impact of strategies, orientations, resources, capabilities, or environment on innovation or on business performance (often moderated by type of innovation or type of environment).

Nature of Change (Internal vs. External): A Potential Substantive Moderator

The nature of change or discontinuity (internal versus external) is also a potential moderator. The external discontinuity or customer perspective was often studied by examining consumers' usage patterns (Gatignon and Xuereb, 1997; Kotabe and Swan, 1995). External change occurs when new products are perceived as totally different, requiring major changes in thinking and behavior, or requiring significant learning (Atuahene-Gima, 1996; Sengupta, 1998). Studies focusing on external change often differentiate types of innovation as evolutionary versus revolutionary (Lynn and Akgun, 2001) or radical versus incremental (Ettlie, Bridges, and O'Keefe, 1984). In contrast, internal (i.e., technological) discontinuity involves a departure from existing technology and practices, often creating high uncertainty (Atuahene-Gima and Ko, 2001; Danneels and Kleinschmidt, 2001; McDermott and O'Connor, 2002). Such studies have delineated the degree to which the technology is different or the different skills and processes necessary for various NPD stages (Kessler and Chakrabarti, 1999; McDermott and O'Connor; Ottum and Moore, 1997; Sethi, 2000; Veryzer, 1998). Most studies examined the impact of NPD processes, strategic orientations, and organizational capabilities on innovation (Atuahene-Gima and Ko; Gatignon and Xuereb; Lukas and Ferrell, 2000; Sethi et al., 2001) or on firm or project success (Atuahene-Gima, 1995; Bonner et al., 2002; de Brentani, 2001; Olson et al., 1995; Song and Montoya-Weiss, 1998).

Product versus Services: Potential Substantive Moderator

Compared with tangible products, services have certain unique characteristics (Song, Di Benedetto, and Song, 2000). *Intangibility* signifies that services cannot be fully assessed by customers prior to purchase (Atuahene-Gima, 1996; Cooper and de Brentani, 1991). *Inseparability* signifies the concurrence of production and consumption (Song et al.), and thus new service development (NSD) requires substantial interaction with the users. Next, although *heterogeneity* offers firms opportunities to design customized and value-generating new services, it may also lead to purchase risk, perceptions of unreliability, and slower customer adoption (Atuahene-Gima; Song et al.). Finally, *perishability* means that services cannot be stored, which creates challenges to match the supply of services with demand (Atuahene-Gima).

Country for Data Collection (Western vs. Asian): Potential Substantive Moderator

The literature describes culture or country effects (Hofstede, 1980; Nakata and Sivakumar, 1996), and Hofstede (1983) identifies the dimensions of power

distance, individualism, masculinity, and uncertainty avoidance. *Power distance* signifies power distributions: unequal distribution, tall hierarchies, and vertical communication may impede NPD (Shane, Venkataraman, and MacMillan, 1995). *Individualism* is characterized by self-interest seeking and loose ties, whereas collectivism seeks group interest. Creativity and inventiveness may originate from nonconformity (Johne and Snelson, 1988; Nakata and Sivakumar), explaining the higher patents in individualistic countries (Shane et al.). *Uncertainty avoidance* is related to insecurity over the future, resistance to change, and risk aversion (Hofstede, 1980). *Masculinity* (vs. *femininity*) involves divisions by gender: masculine cultures emphasize achievement, wealth, mission, and performance; feminine cultures value relationships, sharing, and helping others.

Referring to Gatignon and Anderson's (1988) work, the new product studies were classified as originating in Western countries (e.g., United States, United Kingdom, Canada, Germany, Netherlands, Sweden, or Australia) or in Asian countries (e.g., China, Japan, Taiwan, or Korea). In light of Hofstede's (1983, pp. 104–277) dimensions, Western cultures are characterized by relatively higher individualism but less power distance, uncertainty avoidance, and masculinity. Nakata and Sivakumar (1996) propose that high individualism and low uncertainty avoidance facilitates innovation through personal drive, perseverance, and risk taking (pp. 63, 66), and low power distance and masculinity promote innovation by encouraging diverse ideas from across functional or positional ranks (ibid., pp. 64, 65). They also associate high power distance, collectivism, masculinity, and uncertainty avoidance with successful implementation of existing innovation through collaboration, planning, and unified purpose (ibid., pp. 62–66). Hence, cultural dimensions may have distinct advantages or disadvantages and differential effects on innovation.

Operationalization of Innovation: Potential Methodological Moderators

Two methodological moderators were investigated: (1) level of measurement (categorical vs. continuous scales); and (2) number of scale items (unidimensional vs. multidimensional). Some studies used categorical measures such as radical versus incremental, discontinuous versus continuous, architectural versus modular, and administrative versus technical (e.g., Song and Montoya-Weiss, 1998), whereas others operationalized innovation as continuous measures, generally using 1–5-point or 1–7-point Likert scales (e.g., Moorman and Miner, 1997). Green et al. (1995) argue that innovation should be seen as a continuum with multiple dimensions. Most researchers employed multidimensional scales, whereas a few used single items such as frequency counts of new product introductions (e.g., Markham and Griffin, 1998). Montoya-Weiss and Calantone (1994) assert that little attention has been paid to construct validity and that there is no consistency in operationalization (see also Garcia and Calantone, 2002). Inconsistency in operationalization may have led to contradictory results and confusing implications; thu,s the impacts of these two methodological moderators were tested on every hypothesis developed.

Hypothesis Development

Antecedent to Innovation: Environmental Turbulence (H1: Market and H2: Technological)

Turbulent environments imply dynamic and volatile conditions as a result of uncertain and unpredictable changes in demand and growth rates, continuously emerging or eroding competitive advantages, or low barriers to entry and exit (Atuahene-Gima, 1995; Bourgeois and Eisenhardt, 1988; Covin and Slevin, 1989; Miller and Friesen, 1982). Such conditions lead to difficulties in obtaining accurate or timely information, render obsolete formal assessment systems, and signal product opportunities (Calantone, Schmidt, and Di Benedetto, 1997). Two main sources are (1) technological innovations accelerating the rate of change and causing quick obsolescence; and (2) market changes in customers' preferences or in competitors (Han, Kim, and Srivastava, 1998; Moorman and Miner, 1997; Mullins and Sutherland, 1998; Souder, Sherman, and Davies-Cooper, 1998).

As RBV suggests, firms attempt to pursue emerging opportunities (and thus NPD) to establish competitive advantage in rapidly changing environments (Calantone et al., 2003; Atuahene-Gima and Ko, 2001). Such environments also bring about new opportunities as a result of emerging new, unserved customer needs. However, delays may inhibit success (Bourgeois and Eisenhardt, 1988;Calantone et al.). Thus, turbulence will lead to both the initiation of NPD and an innovative firm posture; that is, both market (H1) and technological (H2) turbulence should be positively related to new product innovation.

As for the proposed moderators, only certain ones should moderate the relationships between turbulence and new product innovation. First is the nature of the discontinuity. In studies that conceptualize innovation based on internal firm changes and the required new firm skills, interest often lies in technology push, and thus the effect of technological turbulence on new product innovation may be stronger. On the other hand, the size of the effects of market turbulence on innovation may be greater in studies that refer to the market discontinuity in their conceptualization because the focus in such studies is often primarily on market turbulence (i.e., customer demand fluctuations and unpredictable competitor actions). Second, Cooper and de Brentani (1991) and Atuahene-Gima (1996) argue that service firms face intense competition given the relative ease of imitation. Due to intangibility and inseparability, service providers face higher customer and competitor uncertainty and hence incur greater risks. Accordingly, the size of the effects of market turbulence (only H1, not H2) on new service innovations may be significantly different compared with the effects size for new product innovation. Finally, product differentiation is a key tool in "individualistic" businesses in Western countries (Nakata et al., 2006). In contrast, the success of Asian companies lies in applying technologies (Song and Parry, 1996, 1997; Song and Xie, 2000). Accordingly, their innovation strategies rest on leveraging existing technologies (as opposed to market dynamics), and building research and development (R&D) rather than marketing capabilities. Thus, the effect size of technological turbulence's impact (only H2) on innovation may be different in Western versus Asian economies:

H1: The relationship between market turbulence and new product innovation will be positive. This relationship should hold irrespective of (i.e., not moderated by) (a) the level of analysis and (d) country but will be moderated by (b) the nature of change, (c) product or service, (e) the level of measurement, and (f) the number scales used.

H2: The relationship between technological turbulence and new product innovation will be positive. This relationship should hold irrespective of (i.e., not moderated by) (a) the level of analysis and (c) product or service but will be moderated by (b) the nature of change, (d) country, (e) the level of measurement, and (f) the number scales used.

Antecedent to Innovation: H3: Customer Orientation and H4: Competitor Orientation

Easily differentiated new product innovations encourage firms to be market oriented. Thus, the firm's strategic orientation (both customer and competitor) plays a crucial role in the NPD process (Atuahene-Gima and Ko, 2001; Gatignon and Xuereb, 1997). *Orientation* can be viewed as a firm culture involving shared values and beliefs (Desphande, Farley, and Webster, 1993) or as a capability enabling anticipation of changes or responses (Lukas and Ferrell, 2000) and facilitating innovation through the articulated needs of customers and the actions of competitors (Han et al., 1998). According to Narver and Slater (1990), market-oriented firms most effectively and efficiently create superior value for customers and achieve competitive advantage; that is, the necessary behaviors are associated with customer orientation and competitor orientation.

Customer (H3) and competitor (H4) orientations have been linked to new product innovation in several studies. Lukas and Ferrell's (2000) findings indicated that customer and competitor orientations jointly increase the introduction of new-to-the-world products, whereas only competitor orientation increases the introduction of me-too products. Gatignon and Xuereb (1997) found that these orientations allowed firms to develop more radical, less costly, and thus higher-performing innovations. However, Han et al.'s (1998) results show a positive relationship between customer orientation and innovation but not between competitive orientation and innovation. This may be because the former two studies incorporated the perspective of the customer, whereas the latter adopts a firm (i.e., an internal) perspective. These studies also differ in their operationalizations of innovation. Accordingly, the nature of change required by the innovation may be a moderator: positive relationships may be weaker in studies that focus on internal change from the firm perspective compared with those that also take into consideration market (i.e., external) disruptions. An internal change may originate from an organization-wide technological orientation rather an external focus on market dynamics. Consequently, customer and competitor orientations may explain less of the variation in innovation when conceptualized with an internal firm perspective.

In the more *individualistic* environments, product and market differentiation are highly valued; hence, firms heavily invest in identifying unmet buyer needs

(Nakata and Sivakumar, 1996; Nakata et al., 2006; Sethi et al., 2001). In contrast, success in Asian companies is driven by technologically advanced, high-volume, low-cost production capabilities (rather than customer focus; Song and Parry, 1996, 1997; Song and Xie, 2000). Hence, moderation is expected in terms of lower effects of customer orientation on new product innovation in the Asian sample.

Competitor orientation should have equal impacts on innovation both at the project and program level. However, customer orientation may lead to bold, radical actions at the program level but may decrease innovation at the project level because a customer focus may induce NPD teams to focus on incremental products, immediate reward, and low-risk projects (Calantone et al., 1997; Mullins and Sutherland, 1998; McDermott and O'Connor, 2002).

As services are provided, sold, and consumed at the same time, service firms (vs. products) may more closely interact with their customers (Atuahene-Gima, 1996; Cooper and de Brentani, 1991). Due to heterogeneity of services, competition-oriented service firms can achieve customer loyalty by offering unique service attributes (Song et al., 2000); however, such advantages inherent in services could be short-lived. Along the same lines, Atuahene-Gima suggest that service firms develop new services relatively more quickly and either skip or less efficiently perform front-end development. Thus, no differential advantage or disadvantage is expected for service firms (vs. product manufacturers), and no moderation is hypothesized:

H3: Customer orientation will have a positive influence on new product innovation. This relationship should hold irrespective of (i.e., not moderated by) (c) product or service but will be moderated by (a) the level of analysis, (b) the nature of change, (d) country, (e) the level of measurement, and (f) the number scales used.

H4: Competitor orientation will have a positive influence on new product innovation. This relationship should hold irrespective of (i.e., not moderated by) (c) product or service but will be moderated by (a) the level of analysis, (b) the nature of change, (d) country, (e) the level of measurement, and (f) the number scales used.

Antecedent to Innovation: Organizational Structure (H5)

Miller (1987, p. 8) defined structure as the "enduring allocation of work roles and administrative mechanisms that allow organizations to conduct, coordinate, and control." The three key NPD structure dimensions are (1) (de)centralization; (2) (in)formalization; and (3) functional differentiation vs. integration (Crawford, 1984; Gupta and Wilemon, 1986; Ottum and Moore, 1997; Song and Parry, 1997; Souder et al., 1998; Troy, Szymanski, and Varadarajan, 2001). Critical issues include coordinating NPD processes, facilitating information and resource sharing, and providing mechanisms for decision making and conflict resolution (Calantone et al., 1994; Olson et al., 1995). Overall structure has been classified as organic versus mechanistic.

Tasks with high (or low) uncertainty supposedly require organic (or mechanistic) structures. Some researchers claim that innovation cannot be successfully pursued in highly centralized, formal, and bureaucratic structures (i.e., mechanistic; Covin and Slevin, 1989; Hage and Dewar, 1973) but that flexible organic structures enhance receptivity to new technology and facilitate new product innovation (Olson et al., 1995; Sethi et al., 2001). However, empirical findings have been mixed. Miller and Friesen (1982) and Meyers, Sivakumar, and Nakata (1999) contend that centralization may facilitate (not hinder) innovation, but Dewar and Dutton (1986) claim that decentralization provides individuals with greater autonomy to decide and act, leading to more exchange of ideas and thus decreasing uncertainty. Similarly, the results of studies focusing on formalization conflict. For instance, Bonner et al. (2002) and Ayers, Dahlstrom, and Skinner (1997) assert that formalization overregulates tasks and role responsibilities, but Tatikonda (1999) shows that formality of execution is positively (not negatively) related to innovation.

It is possible that there is no one structural solution: mechanistic versus organic structures may not constitute substitutes but rather complements. This notion is consistent with the organizational control literature, which supports the use of a portfolio of controls (Jaworski, Stathakopoulos, and Krishnan, 1993). Functional organizations were advocated in the earlier literature (Achrol, 1991; Ayers et al., 1997; Griffin and Hauser, 1996; Olson et al., 1995) but were later thought to discourage cooperation rather than to resolve conflicts and create harmony. Other structures, such as matrix and teams, were thought to increase integration and overcome the weaknesses of traditional structures (Achrol). In NPD, another alternative is a stages process that specifies sequentially over time the tasks and employees responsible (Griffin and Hauser).

The conflicting results may be due to the level of analysis. Mechanistic approaches may be beneficial at the program level in coordinating multiple initiatives by making priorities and goals explicit. However, formalized and centralized structures may freeze the status quo and inhibit the diffusion of ideas among project team members. Thus, for projects, organic structures may be best (Montoya-Weiss and Calantone, 1994; Olson et al., 1995) since decentralization, autonomy, and empowerment may lead to conflict resolution and effective decision making. Moreover, divergent results may be due to the nature of change: studies that focus on internal changes may endorse centralization for conflict resolution, whereas research on innovations' external disruptions may support organic structures for more creative customer solutions.

Compared with NPD, NSD may require higher cross-functional work and standardization to reduce the effects of service intangibility and perishability (Atuahene-Gima, 1996; Cooper and Kleinschmidt, 1987). Standardization in NSD may also hinder customization and customer involvement. De Brentani (2001) shows a relationship between formal development processes and new service performance for incremental but not radical innovations. Therefore, mechanistic structures are expected to encourage less innovative services, moderating H5.

As for "country" as moderator, the Japanese model is characterized by group decision making and actions, followed by approval by a higher authority (Nakata and Sivakumar, 1996; Nakata et al., 2006; Souder and Song, 1998). Song and Parry (1997) argue that project selection decisions are not finalized in Japanese firms unless the all functions agree, indicating the high importance given to cross-functional integration. Souder and Song (p. 86) suggest that centralization and integration have distinct meanings: "Though delegation occurs in the Japanese management system, power appears to be much less widely distributed, closer control seems to be exercised and the amount of independent individual decision making appears to be much lower in Japan than in US." Widespread senior managers' involvement (as in Japan) is generally viewed as an inhibitor of idea generation and creativity in the United States. Thus:

H5: Mechanistic organizational structure will be negatively related to new product innovation. This relationship will be moderated by (a) the level of analysis, (b) the nature of change, (c) product or service, (d) country, (e) the level of measurement, and (f) the number scales used.

Outcome of New Product Innovation: New Product Performance (H6)

The effect of innovation on performance outcomes is debated in the literature. For some researchers, innovative products create more opportunities for differentiation and hence relative advantage (Gatignon and Xuereb, 1997; Kleinschmidt and Cooper, 1991; Song and Parry, 1996). Drawing upon RBV for H6, innovating firms with unique knowledge and capabilities as well as superior/novel products, should enjoy high performance (Droge et al., 2008; Han et al., 1998). More innovative, differentiated products provide more value to customers, and thus advantage is greater (Ettlie and Rubenstein, 1987; Gatignon and Xuereb, 1997; Kleinschmidt and Cooper, 1991; Sengupta, 1998). Other studies conclude that less innovative products have less market uncertainty and higher firm synergies, whereas Tatikonda (1999) and Calantone et al. (1994) found no relationship at all.

The hypothesized positive relationship between innovation and performance (H6) should be moderated by the nature of change (internal vs. external; Danneels and Kleinschmidt, 2001; Garcia and Calantone, 2002). Innovation developed with an internal focus may not explain performance outcomes. For example, Calantone, Chan, and Cui (2006) found that innovativeness had no impact on profitability after controlling for product advantage and customer familiarity.

Finally, surveys of Asian manufacturers indicate that innovation predicts new product success (e.g., Langerak and Hultink, 2006; Song and Parry, 1996, 1997; Song and Montoya-Weiss, 2001). Nakata et al. (2006) found positive impact of new product advantage on performance in Korea and Japan. However, in an NPD comparative study in the United States versus Japan, Song and Parry (1997) found substantial differences in the degree to which differentiation engenders new product outcomes. Given the high importance of product differentiation in Western economies, stronger effects on new product performance are hypothesized. Hence:

H6: The relationship between new product innovation and new product performance will be positive. This relationship should hold irrespective of (i.e., not moderated by) the (a) level of analysis and (c) product or service but will be moderated by (b) the nature of change, (d) country, (e) the level of measurement, and (f) the number scales used.

Methodology

Meta-analysis is an objective and efficient way to summarize and make sense of large literatures (Rosenthal, 1991). It integrates results, revealing cumulative knowledge, general principles (Hunter and Schmidt, 1990), and gaps. A data set of papers is required.

Sample of Articles

New product innovation has been described using the words *radical, incremental, really new, imitative, discontinuous, architectural, modular, evolutionary, administrative and technical, innovativeness, advantage*, and *newness* (see, e.g., Garcia and Calantone, 2002). Using these keywords, JSTOR and ProQuest (ABI Inform database) were searched for papers published in scholarly journals from 1989 to 2006. Referring to journal ranking studies by Hult, Neese, and Bashaw (1997) and Linton and Thongpapanl (2004), published refereed papers were sought in *Journal of Marketing, Journal of Marketing Research, European Journal of Marketing, Journal of the Academy of Marketing Science, Journal of Consumer Research, Journal of Consumer Marketing, Journal of Consumer Psychology, Advances in Consumer Research, Journal of Product Innovation Management, Creativity and Innovation Management, Journal of Management, Organization Science, Management Science, Academy of Management Journal, Administrative Science Quarterly, MIS Quarterly, Journal of Business Research, Strategic Management Journal, Journal of Marketing Management, Journal of Business and Industrial Marketing, Industrial Marketing Management*, and *IEEE Transactions on Engineering Management*. Literature reviews were also searched; a few papers prior to 1989 were found because they were referenced in another paper. Although the list of journals does not include a few high-impact and good-quality journals (e.g., *International Journal of Research in Marketing*), it is a representative list of major leading journals that publish innovation studies.

First, papers that examined product adoption by consumers were excluded: 134 of 232 papers gathered were retained. Second, the 134 were evaluated as to whether they empirically tested relevant relationships: 115 did, of which 74 reported correlations and 64 had hypotheses of interest. Two papers (Song and Montoya-Weiss, 1998; Yoon and Lilien, 1985) reported the difference of means for effect size; these were converted into correlations (as in Hunter and Schmidt, 1990). Several studies split samples (e.g., Miller and Friesen, 1982; Tatikonda, 1999), whereas some employed two or three different sampling frames (i.e., Cho and Pucik, 2005; Nakata et al., 2006; Yoon and Lilien). These studies were treated as independent. The result was 70 papers (starred in the References) with total sample size of 12,921.

Variable Coding

Correlation data on the turbulence–innovation relationships were collected: that is, technological turbulence based on the rate of change associated with the new product technologies; and market turbulence based on the extent to which customers and preferences change, and the degree to which the competitive advantages emerge or erode (cf. Calantone, Garcia, and Droge, 2003; Han et al., 1998; Moorman and Miner, 1997).

Customer orientation was measured using scales that gauge understanding of current and latent needs of target customers (cf. Atuahene-Gima, 1995; Narver and Slater, 1990). Competitor orientation was generally operationalized as the degree of continual monitoring of strengths and weaknesses and long-term capabilities and strategies of key competitors.

Studies on organizational structure have focused on formalization, centralization, and cross-functional integration (e.g., Ayers et al., 1997; Olson et al., 1995; Ottum and Moore, 1997). The correlations were averaged when multiple correlations were reported for the relationships of these constructs with new product innovation.

Finally, correlations were collected that involved performance based on market outcomes (e.g., satisfaction, whether revenue and sales goals are met) and product-level measures (e.g., meeting quality goals, costs, timeliness) (cf. Atuahene-Gima, 1995; Griffin and Page, 1996).

Methodology: Analyses Performed

The data were analyzed in three stages: (1) bivariate analysis of corrected correlations; (2) multivariate structural equation analysis (cf. Henard and Szymanski, 2001); and (3 moderation analysis where the potential moderators were analyzed by conducting split-group analyses.

Bivariate Analysis

Correlations at the test level rather than study level were used following Hunter and Schmidt (1990), and

outliers were detected as proposed by Huffcutt and Arthur (1995). We employed the sample-adjusted meta-analytic deviancy (SAMD) statistic, which is derived by dividing the difference between the value of each individual correlation coefficient and the sample weighted mean coefficient computed without the study correlation by the standard error of the difference. This procedure eliminated one correlation (for the relationship between structure and new product innovation). Corrections for attenuation used Hunter and Schmidt (1990)'s artifactual distribution approach, employing mean values of reliabilities. This is because Cronbach's alpha values were not available in every study and were reported sporadically. Each reported correlation (r_{XY}) was corrected as follows:

$$r_c = \frac{r_{XY}}{E(\sqrt{r_{XX}}) \cdot E(\sqrt{r_{YY}})}$$

where r_c is the corrected correlation, and $E(\sqrt{r_{XX}})$ and $E(\sqrt{r_{YY}})$ are the mean values of reliabilities for each scale.

Next, corrections for sampling error were done, and weighted average correlations based on sample sizes for each of the relationships were calculated using (Table 1)

$$\bar{r} = \Sigma w_i r_i / \Sigma w_i = \Sigma [N_i r_i] / \Sigma N_i$$

where $\bar{r}$is weighted average correlation, and N is the sample size reported in the corresponding study.

To study moderation, first the remaining variance after correction for sampling error was gauged by subtracting variance due to sampling error ($S_e^2 = (1 - \overline{r^2})^2/\bar{N}$) from total variance in individual correlations ($S_r^2 = \Sigma[N_i(r_i - \bar{r})^2]/\Sigma N_i$). Hunter and Schmidt (1990, p. 110) suggest analyzing the effects of research artifacts if this remaining variance is nontrivial. The remaining variance was large for all hypothesized relationships (73% to 99% of the original variance in individual correlations). Support was found overall for moderating effects.

Multivariate Analysis

Using the correlations as inputs (Table 1), structural equation modeling using EQS software version 6.1 was performed (Bentler, 1995; Bollen, 1989; Vismesvaran and Ones, 1995). To test the hypotheses, the overall sample ($N = 12{,}921$) was analyzed; $N = 1{,}000$ was used since all correlations had a cumulative sample size higher than 1,000 (Rosenthal, 1991). This ensures conservative tests for the hypotheses. Generalized least squares (GLS) estimation was used because it has less restrictive assumptions and does not assume independence. In a meta-analysis, the number of pairwise correlations varies, and the goal was to eliminate bias due to studies that provided more correlations across the moderator groups (Raudenbush, Becker, and Kalaian, 1998). These correlations cannot be treated as independent.

Moderation Analysis

The correlation data were partitioned six different ways based on the six moderators. Sample size

Table 1: Weighted Average Correlations: The Overall Sample[a]

		1	2	3	4	5	6	7
1	New Product Performance	1.00						
2	Innovation	0.33**	1.00					
		(42; 9511)						
3	Market Turbulence	0.02	0.10	1.00				
		(18; 3944)	*(18; 3807)*					
4	Technologica Turbulence	0.05	0.23**	0.35**	1.00			
		(13; 3326)	*(14; 2758)*	*(11; 2886)*				
5	Organizational Structure	−0.06	−0.01	−0.08	−0.04	1.00		
		(18; 2479)	*(52; 5957)*	*(11; 2129)*	*(6; 1181)*			
6	Customer Orientation	0.30**	0.33**	0.06	0.17*	−0.22**	1.00	
		(23; 4615)	*(29; 5700)*	*(10; 2455)*	*(8; 2072)*	*(15; 2320)*		
7	Competitor Orientation	0.22**	0.29**	0.18**	0.14§	−0.25**	0.61**	1.00
		(9; 1895)	*(10; 1821)*	*(5; 1289)*	*(4; 1108)*	*(10; 1747)*	*(9; 1986)*	
	STD DEV	2.16	1.66	1.09	1.30	1.56	1.19	1.00

[a] The numbers in parentheses indicate (number of correlations; corresponding sample sizes).
§ Significance at .10 level.
* Significance at .05 level.
** Significance at .01 level.

weighted average correlations were calculated for each subgroup, and split-group path analyses were conducted (Bollen, 1989). The overall mean sample size was split in proportion to each artifact group sample size: for "level of analysis" ($n = 1{,}000 * 8{,}655/12{,}921 = 670$ for program and $n = 1{,}000 * 4{,}266/12{,}921 = 330$ for project), "nature of change" ($n = 1{,}000 * 9{,}127/12{,}921 = 706$ for internal and $n = 1{,}000 * 3{,}794/12{,}921 = 294$ external), "level of measurement" ($n = 1{,}000 * 1{,}442/12{,}921 = 112$ for categorical and $n = 1{,}000 * 11{,}479/12{,}921 = 888$ for continuous), "number of item scales" ($n = 1{,}000 * 4{,}176/12{,}921 = 323$ for unidimensional and $n = 1{,}000 * 8{,}745/12{,}921 = 677$ for multidimensional), "products or services" ($n = 1{,}000 * 7{,}060/12{,}921 = 546$ for products and $n = 1{,}000 * 5{,}861/12{,}921 = 454$ for services), and "country" ($n = 1{,}000 * 10{,}156/12{,}921 = 786$ for Western and $n = 1{,}000 * 2{,}765/12{,}921 = 214$ for Asian countries).

RESULTS

The parameter estimates are provided in Table 2, and the conclusions are summarized in Table 3. Cohen (1977) regards a correlation of .10 as a small effect size, .30 as medium, and .50 as large. Thus, the relationships between orientation constructs and innovation ($r = .33$, $p < .01$ for customer and $r = .29$, $p < .01$ for competitor) as well as the link between innovation and performance ($r = .33$, $p < .01$) represent medium effect sizes. The technological turbulence–innovation relationship was $r = .23$ ($p < .01$); all other relationships were not significant (Table 2).

Turbulence and Innovation (H1, H2). The relationship between market turbulence and new product innovation was not significant ($\beta_1 = .007$; n.s.), but technological turbulence's impact was positive ($\beta_2 = .172$; $p < .01$), supporting H2 and not H1 (Tables 2 and 3). "Nature of change" moderated this relationship: (1) the market turbulence–innovation link was positive when the innovation is conceptualized as an internal change versus negative when external; and (2) technological turbulence was more positive when innovation is conceptualized as external (vs. internal). Hence, H1b and H2b were both supported. "Country: Western vs. Asian" moderated the influence of technological turbulence but not market turbulence (supporting H1d, H2d): technological tur-

Table 2: Model Results: Standardized Path Estimates for Different Groups and *t*-Values[a]

Groups	Overall Sample	Program Level	Project Level	Internal Perspective	External Perspective	Products	Services	Western	Asian	Continuous Measurement	Categorical Measurement	Multidimensional Measurement	Unidimensional Measurement
Variables	($n = 1{,}000$)	($n = 670$)	($n = 330$)	($n = 700$)	($n = 300$)	($n = 540$)	($n = 460$)	($n = 770$)	($n = 230$)	($n = 886$)	($n = 114$)	($n = 854$)	($n = 146$)
Market Turbulence	.007 (n.s.)	.018; .016 (n.s.)		.066 (n.s.)	−.160 ($t = -2.791$)	.014; .017 (n.s.)		.006; .006 (n.s.)		−.013; −.013 (n.s.)		.055; .060 (n.s.)	
Technological Turbulence	.172 ($t = 5.537$)	.150; .180 ($t = 4.764$)		.112 ($t = 2.984$)	.190 ($t = 3.164$)	.125; .176 ($t = 4.620$)		.137 ($t = 3.893$)	.264 ($t = 3.684$)	.151; .110 ($t = 4.660$)		.120; .091 ($t = 3.507$)	
Customer Orientation	.231 ($t = 6.296$)	.265 ($t = 6.262$)	.026 (n.s.)	.260; .106 ($t = 5.168$)		.223; .229 ($t = 4.768$)		.283 ($t = 6.436$)	.004 (n.s.)	.309 ($t = 8.205$)	−.505 ($t = -2.739$)	.243 ($t = 6.658$)	−.018 (n.s.)
Competitor Orientation	.147 ($t = 3.993$)	.057; .207 ($t = 3.238$)		.171; .058 ($t = 3.450$)		.024; .088 (n.s.)		.098; .086 ($t = 2.305$)		.129 ($t = 3.497$)	.429 ($t = 4.012$)	.190; .168 ($t = 4.618$)	
Organizational Structure	.084 ($t = 2.892$)	.086; .121 ($t = 2.925$)		−.038 (n.s.)	.293 ($t = 4.408$)	.165 ($t = 3.900$)		−.225 ($t = -3.719$)	.082; .070 ($t = 2.411$)	.070 ($t = 2.258$)	−.391 (n.s.)	.189 ($t = 4.024$)	−.038 (n.s.)
New Product Performance	.329 ($t = 11.026$)	.218; .389 ($t = 8.950$)		.345 ($t = 8.916$)	.450 ($t = 7.818$)	.447; .270 ($t = 11.879$)		.354 ($t = 10.123$)	.266 ($t = 3.620$)	.310 ($t = 9.084$)	.358 ($t = 3.657$)	.327 ($t = 8.512$)	.250 ($t = 2.496$)
GFI	.949	.925		.922		.901		.940		.945		.877	
RMSEA	.116	.122		.132		.143		.112		.109		.166	

[a] GFI, goodness-of-fit index. RMSEA, root mean square error of approximation.

Table 3: Overview of the Hypotheses and Results

Hypothesized Relationship	Moderators	Hypotheses and Findings	
Market Turbulence to		H1: POSITIVE	Not supported
New Product Innovation	Level of Analysis	H1a: no	Supported
	Nature of Change	H1b: yes	Supported
	Product/Service	H1c: yes	Not supported
	Country: Western vs. Asian	H1d: no	Supported
	Level of Measurement	H1e: yes	Not supported
	Number of Item Scales	H1f: yes	Not supported
Technological Turbulence to		H2: POSITIVE	Supported
New Product Innovation	Level of Analysis	H2a: no	Supported
	Nature of Change	H2b: yes	Supported
	Product/Service	H2c: no	Supported
	Country: Western vs. Asian	H2d: yes	Supported
	Level of Measurement	H2e: yes	Not supported
	Number of Item Scales	H2f: yes	Not supported
Customer Orientation to		H3: POSITIVE	Supported
New Product Innovation	Level of Analysis	H3a: yes	Supported
	Nature of Change	H3b: yes	Not supported
	Product/Service	H3c: no	Supported
	Country: Western vs. Asian	H3d: yes	Supported
	Level of Measurement	H3e: yes	Supported
	Number of Item Scales	H3f: yes	Supported
Competitor Orientation to		H4: POSITIVE	Supported
New Product Innovation	Level of Analysis	H4a: no	Supported
	Nature of Change	H4b: yes	Not supported
	Product/Service	H4c: no	Supported
	Country: Western vs. Asian	H4d: yes	Not supported
	Level of Measurement	H4e: yes	Supported
	Number of Item Scales	H4f: yes	Not supported
Structure (mechanistic) to		H5: NEGATIVE	Not supported
New Product Innovation	Level of Analysis	H5a: yes	Not supported
	Nature of Change	H5b: yes	Supported
	Product/Service	H5c: yes	Supported
	Country: Western vs. Asian	H5d: yes	Not supported
	Level of Measurement	H5e: yes	Supported
	Number of Item Scales	H5f: yes	Supported
New Product Innovation		H6: POSITIVE	Supported
to Performance	Level of Analysis	H6a: no	Supported
	Nature of Change	H6b: yes	Supported
	Product/Service	H6c: no	Supported
	Country: Western vs. Asian	H6d: yes	Supported
	Level of Measurement	H6e: yes	Supported
	Number of Item Scales	H6f: yes	Supported

bulence–innovation link was stronger in the Asian sample. No other moderation was found, supporting H1a and H2a (but not H1c, H1e, and H1f and H2c, H2e, and H2f).

Customer Orientation and Innovation (H3). Customer orientation positively influenced innovation overall ($\beta_3 = .231$; $p < .01$), supporting H3. This relationship was moderated, supporting H3a, H3c, H3d, H3e, and H3f but not H3b (H3c proposed no moderation). The relationship between customer orientation and innovation was (1) positive at the program level versus n.s. for projects; (2) positive in Western countries versus n.s. elsewhere; (3) positive for continuous scales versus negative for categorical; and (4) positive with multidimensional scales versus n.s. otherwise.

Competitor Orientation and Innovation (H4). H4 was supported with a positive effect of competitor orientation on innovation overall ($\beta_4 = .147$; $p < .01$). This relationship was more positive when categorical versus continuous scales were used, supporting H4a, H4c, and H4e (see Table 3). "Nature of change," "country," or "number of item scales" did not significantly moderate this relationship; hence, H4b, H4d, and H4f were not supported.

Organizational Structure and Innovation (H5). The impact of structure on innovation was positive overall ($\beta_5 = .084$; $p < .01$), contradicting H5 (which proposed a negative relationship). The strength of this relationship did vary across "level of analysis" or "country"; thus, H5a and H5d were rejected. This relationship was moderated, supporting H5b, H5c, H5e, and H5f. Mechanistic structure did not impact innovation when innovation is defined as involving an internal change but had a positive impact when innovation was external. The effect was negative for "services" but positive for "products." This path was n.s. for categorical measures and positive otherwise.

Innovation and Performance (H6). In the overall sample, the relationship between innovation and performance was positive ($\beta_6 = .329$; $p < .01$), supporting H6. The strength of this relationship was significantly moderated by all proposed moderators except "level of analysis" and "product or service. It is greater (1) when innovation was defined with respect to external change, (2) when the study was in a Western economy, and when measurement was (3) "categorical" and (4) "multidimensional. "Therefore, H6b, H6c, H6d, and H6e but not H6a were accepted (Table 3).

Discussion and Conclusion

The primary contributions of this study were (1) to provide a quantitative synthesis of the innovation research by deriving empirical generalizations and (2) to investigate the sources for inconsistencies in the empirical results. From a theoretical perspective, this synthesis corroborated the premises of the RBV framework regarding the determinants and the performance outcome of innovation. Tested using the entire sample, the baseline model included turbulence constructs, orientations, and structure as exogenous constructs predicting innovation, whereas new product performance was an endogenous variable resulting from innovation.

The results show that technological turbulence (but not market turbulence) promoted innovation directly (supporting the literature that states that rising environmental uncertainty increases the rate and level of innovation needed to survive; e.g., Kotabe and Swan, 1995). Rapid technological advancements, but not necessarily uncertainties in customer expectations and competitive intensity, seem to encourage firms to innovate.

Customer and competitor orientations were both directly positively related to innovation. Both are required to develop and commercialize innovations that incorporate substantially different core technologies, can easily be differentiated by customers, and provide substantially higher customer benefits relative to previous or competing products. Perhaps an entrepreneurial or technological orientation can play a similar role, an issue left for future research.

Mechanistic structures exerted a positive impact on innovation (contrary to expectations and the general view in NPD research). On the other hand, mechanistic structures have an adverse direct effect on new product performance. This finding is a major contribution: the research supports the use of a formal and centralized organization and the use of mechanisms to control and integrate activities and resource flows (Johne and Snelson, 1988). Top-management direction may foster better interaction across departments, and a business plan along with formal performance specifications may minimize mismatches and conflicts (Crawford, 1984; Johne and Snelson; Sethi, 2000). Miller and Friesen (1982) and Meyers et al. (1999), for example, argue that a formal, centralized organization facilitates a more uniform response by reducing internal conflicts and ambiguities through a higher locus of control.

Finally, as expected, innovation was positively linked to new product performance. The results also indicate patterns of mediation. More specifically, technological turbulence (.057, $t = 4.948$), customer and competitor orientations (.076, $t = 5.468$; and .048, $t = 3.754$), and structure (.028, $t = 2.797$) all exert indirect effects on performance through innovation. These results generally support the basic tenets of RBV, stating that firms achieve superior performance by using internal resources and capabilities in distinctive ways (Day, 1994; Mahoney and Pandian, 1993; Penrose, 1959). For example, the indirect effect of technological turbulence on performance through innovation signals the importance of innovation capabilities: a firm achieves market returns if it can exploit the opportunities that technological advancements present. This supports the "innovate or die" sentiment: turbulence makes innovation more important, and success is attainable only through innovation. A rival model specifying direct effects from turbulence and orientation constructs to performance was analyzed but rejected.

Results of the Analyses of the Potential Moderators

Level of analysis—project versus program—moderated only the customer orientation–innovation link.

Customer orientation engenders innovation at the program level (but not project level), leading to bold actions overall. Moreover, customer orientation at the program level had an indirect effect on performance through innovation (.058, $t = 4.863$), as proposed in RBV theory. In contrast, it may be that project-level customer orientation leads to incrementally innovative products rather than to bold and radical ones (Atuahene-Gima, 2005; Atuahene-Gima et al., 2005; Baker and Sinkula, 2005). Note that across this moderator the impacts of mechanistic structures on innovation were positive and equal. These results imply that project teams need direction and standardization (Bonner et al., 2002), that NPD should be guided by a clear statement of goals, and that top-management support is needed at both program and project levels (Gupta and Wilemon, 1986; Johne and Snelson, 1988; Sethi et al., 2001). Top management must manage different functional groups to ensure tasks are accomplished (Griffin and Hauser, 1996; Swink, 2000) and must control the monitoring of tasks or performance to identify weaknesses and foster remediation (Miller and Friesen, 1982). Last, centralization may increase the accessibility and assimilation of knowledge and encourage tacit learning (Aiken, Bacharach, and French, 1980; Troy et al., 2001).

The second moderator was internal versus external discontinuity, and these results show interesting and unexpected conclusions. First, market turbulence was unrelated to innovation when internal influence was studied but was negatively related when the innovation is conceptualized with respect to external changes. Technological turbulence, on the other hand, more strongly encouraged innovation when it is conceptualized from an external perspective (although both effects were positive). These findings imply that frequent technological advancements encourage new-to-the-market innovations (vs. new-to-the-firm). Second, when the innovation is defined regarding internal change, mechanistic structure was not significantly linked with innovation; however, it positively affects innovation when defined as an external market discontinuity. It seems that mechanistic structures impose enough order on externally imposed chaos to permit enhanced innovation. Finally, the relationship of innovation to performance is stronger when the innovation is defined with respect to external discontinuity (supporting Calantone et al., 2006).

Third, although mechanistic structures fostered innovation for products, this link was negative for service firms. This result was expected: innovation in service organizations requires more flexible, collaborative approaches to exploit opportunities for innovation, to surpass competitors, and to attain superior performance. Note that for both products and services technological turbulence increases the rate of innovation needed to succeed and innovation engenders superior performance in turn; however, market turbulence has no impact.

"Country," the fourth moderator, had moderating effects, even though the Western versus Asian split was a very "rough cut." Technological turbulence is a stronger determinant of innovation in Asian countries; the effect of customer orientation on innovation is found only in the Western group. However, regardless of "country or culture," mechanistic structures positively predict innovation: centralized and formalized approaches foster effective and efficient interaction across departments and ensure that team members are coordinated (Gupta and Wilemon, 1986; Olson, Slater, and Hult, 2005; Olson et al., 1995).

Finally, two methodological moderators related to the operationalization of innovation were investigated: level of measurement and number of scale items. Both influenced the paths between structure–innovation, customer orientation–innovation, and innovation–performance. Overall, measurement artifacts can have a major impact on research results, but innovation was positively related to performance in all groups, a robust result (Kleinschmidt and Cooper, 1991).

Conclusion and Managerial Insights

The evaluations of the six hypotheses and potential moderators provide insights for managers as well as researchers. First, market turbulence is overall not a direct antecedent to innovation (but researchers who study internal firm changes required by the innovation may find positive effects). Second, technological turbulence is overall positively related to innovation, and this relationship becomes even stronger when external discontinuities are taken into consideration or when the data are collected from Asian countries. The results for either turbulence construct held whether the level of analysis was project versus program or whether a service versus product was examined (i.e., the results are robust). The implication is that the greatest source of turbulence that managers must track is technological in nature.

Third, customer orientation encourages innovation overall but especially at the program (as opposed to

project) level in Western countries. Managers should thus include customer input in managing their overall new product programs. Fourth, competitor orientation also positively influences innovation overall. The service versus product distinction did not make a difference in the effects of either customer or competitor orientation construct; this again illustrates to managers the robustness of these results.

Fifth, mechanistic organizational structures foster innovation overall and regardless of program versus project analysis or "country." However, this relationship was positive for products but negative in service samples. This suggests that product versus service managers need different levels of decentralization and formalization, with services requiring organicity.

Finally, innovation is a direct antecedent to performance, and this effect is stronger when the data are collected from Western countries. This relationship holds regardless of whether the level of analysis is the new product program versus project or whether the innovation is a product or service. Again, the robustness of this result demonstrates that the importance of innovation to new product performance is universal and that all managers should recognize this route to performance enhancement.

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