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Tradeoffs in marketing exploitation and exploration strategies: The overlooked role of market orientation

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Abstract

Marketing strategy can improve a firm's current expertise (marketing exploitation strategy) and/or require the development of new knowledge and skills (marketing exploration strategy). Research in strategy and organizational learning suggests that utilizing both approaches may compromise firm effectiveness in each individual area and reduce firm financial performance. We argue that a firm's market orientation allows it to combine marketing exploitation and exploration strategies effectively by providing a unifying frame of reference focused on customer goals, facilitating market information flows between the two strategy processes, and integrating the two activities by serving as a dynamic market linking capability. A study of Dutch firms in the packaged food industry indicates that a firm's strong market orientation facilitates a complementarity of high levels of marketing exploration and marketing exploitation project-level strategies which results in improved new product financial performance measured at two distinct points of time. However, as predicted by the tradeoff, firms with a weak market orientation engaging in high levels of both strategies display a significant reduction in new product financial performance.

Keywords: Marketing strategy; Market orientation; Complementarities; New products

1. Introduction

A key issue in the literature is how successfully firms learn when they are exploiting current knowledge and skills versus exploring new knowledge and skills (March, 1991). A long tradition of research suggests that these are competing strategies for three reasons. First, learning theorists have demonstrated that exploitation strategies tend to limit the amount of firm exploration and that exploration strategies tend to limit the amount of firm exploitation (e.g., March, 1991). Second, exploitation and exploration strategies often compete for limited firm resources and are associated with opposite organizational structures and

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cultures. As such, firms that pursue both strategies are viewed as lacking focus and internal fit (e.g., Miller & Friesen, 1986). Third, contingency theorists argue that firms should utilize one of these strategy approaches to optimize fit with the external environment (e.g., Galbraith, 1973; Lawrence & Lorsch, 1967).

Despite these criticisms, Levinthal and March (1993, p. 105) argue that firms must engage in both strategies. They state:

An organization that engages exclusively in exploration will ordinarily suffer from the fact that it never gains the returns of its knowledge. An organization that engages exclusively in exploitation will ordinarily suffer from obsolescence. 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. Survival requires a balance, and the precise mix of exploitation and exploration that is optimal is hard to specify.

Likewise, Lewin and Volberda (1999, p. 523) note: "These forms need not be contradictory processes. They can be complementary, and organizations must learn how to carry out both forms."

Following these recommendations, research in various fields has recently shifted focus from *whether* to *how* firms can achieve a complementarity of these strategies. Brown and Eisenhardt (1997), for example, introduce semi-structured and time-paced strategies as managerial tools to achieve this dynamic balance (also referred to as "edge of chaos") in product innovation. Likewise, the integration of exploration and exploitation is central to work examining dynamic or combinative capabilities (Grant, 1996; Kogut & Zander, 1992; Teece, Pisano, & Shuen, 1997). In the product development literature, scholars often study the degree of fit between a new product and prior activities (e.g., marketing and technological synergy; Henard & Szymanski, 2001; Montoya-Weiss & Calantone, 1994; Moorman & Miner, 1997; Song & Parry, 1997). In all these cases, efforts to create a complementarity by balancing exploitation and exploration remain a challenge and they are usually accomplished on a project-by-project basis depending on the degree of uncertainty (e.g., Olson, Walker, & Ruekert, 1995). Given this, there remains a need for additional conceptual treatments and empirical investigations into how firms can more systematically work to create complementarities of these strategic learning approaches.

We contribute to this literature by suggesting that a firm's market orientation can systematically promote synergies between exploratory and exploitative marketing strategy activities. A firm's market orientation has been described as: (1) a unifying belief that emphasizes serving and creating value for customers (Deshpandé, Farley, & Webster, 1993; Homburg & Pflesser, 2000; Ruekert, 1992); (2) a set of organization-wide processes involving the generation, dissemination, and responsiveness to intelligence pertaining to current and future customer needs (e.g., Kohli & Jaworski, 1990; Narver & Slater, 1990; Slater & Narver, 1999); and (3) a firm capability to anticipate market requirements ahead of competitors and to create durable relationships with customers, channel members, and suppliers (Day, 1994). Using these views, we argue that a firm's market orientation reduces the tensions between exploration and exploitation strategies and creates the opportunity for cross-fertilization and complementary learning between the two strategies.

This approach may appear to run counter to recent attempts to cast market orientation as having either a reactive (focusing on expressed customer needs) or proactive (focusing on latent customer needs) bent. Several strategic management scholars have suggested that being market-oriented locks a firm to its current customers, thereby causing the firm to miss out on the wave of new technologies and emerging customer needs (Christensen & Bower, 1996; Hamel & Prahalad, 1991). Others counter by acknowledging that "how a market orientation benefits the firm continues to evolve" (Slater & Narver, 1999, p. 1168) and "future studies need to address the potential intricacies of the relationships among market orientation, entrepreneurship, and organizational learning" (Hult & Ketchen, 2001, p. 905). We contribute to this debate by suggesting that market orientation does not necessarily guide the firm to be reactive or proactive—only to focus on customers. Therefore, we do not locus the firm's exploitation or exploration marketing strategies in a firm's market orientation. Instead, we separate out this element so we can understand how market orientation impacts the joint effects of exploitation and exploration.

We begin by describing the nature of marketing exploitation and exploration in more detail, followed by evidence of the tension between these strategic approaches. We follow with a discussion of how a firm's market orientation reduces these tensions when firms attempt to use both strategies within a single product development project. We then present an empirical test of our ideas in the packaged food industry in The Netherlands.

2. Marketing exploitation and exploration strategies

2.1. Definitions of marketing strategy learning approaches

Our focus is on strategies associated with product development activities because we think this is likely to be the level at which decision makers address the tradeoffs associated with relying on prior learning. We also focus on strategy decisions typically related to the marketing function or marketing tasks, such as product-market decisions involving targeting, segmentation, and positioning or decisions involving the marketing mix.

While we concede that there is often no black-and-white distinction between exploitation and exploration marketing strategies, we think it is also the case that strategies tend to exhibit a dominant emphasis. *Marketing exploitation strategies* are therefore defined as strategies that primarily involve improving and refining current skills and procedures associated with existing marketing strategies, including current market segments, positioning, distribution, and other marketing mix strategies. If a firm improves all of these simultaneously, the level of marketing exploitation is higher than if it engages in only one improvement. Marketing exploitation thus is determined by the aggregate effect of these improvements. Exploitation strategies therefore operate on a firm's existing learning curve by strengthening its current routines (March, 1991), core competences (Prahalad & Hamel, 1990), and capabilities (Collins & Montgomery, 1995; Leonard-Barton, 1992). An example of a pure exploitation strategy is an experience curve in which a firm generates low price through cumulative production. Exploitation strategies have also been referred to as "adaptive learning" (Slater & Narver, 1995) and a "single-loop system" (Argyris & Schön, 1978).

Marketing exploration, on the other hand, has been referred to as "generative learning" (Slater & Narver, 1995) and a "double-loop system" (Argyris & Schön, 1978). Although it may involve some elements of existing strategies, *marketing exploration strategies* are defined as strategies that primarily involve challenging prior approaches to interfacing with the market, such as a new segmentation, new positioning, new products, new channels, and other marketing mix strategies. If a firm does all of these simultaneously, the level of marketing exploration is higher than if it engages in only one change. The degree of marketing exploration is therefore determined by the aggregate effect of these changes.

Our concepts of marketing exploitation and exploration relate to prior classifications of project newness or innovation radicality appearing in the product development literature. Henard and Szymanski (2001, p. 364), for example, review concepts associated with marketing synergy, which they define as "congruency between the existing marketing skills of the firm and the marketing skills needed to execute a new product initiative successfully." This concept is similar to marketing exploitation and exploration in that it captures, in a general way, the degree of fit between prior and new competences. There are three key differences, however.

First, we focus on the degree to which adopted strategies improve (exploitation) or change (exploration) prior marketing approaches rather than the congruence or fit of skills to proposed strategies. Second, whereas a singular focus on degree of synergy forces an implicit tradeoff between building on current skills *or* learning new skills, our use of two concepts and associated measures allows for the possibility that firms can attempt both strategies. This is our fundamental thesis and the subsequent sections elaborate on it.

Third and most importantly, some might suggest that marketing exploitation or exploration should be conceptualized and measured by assessing similarity to or newness of the target segment, positioning, product, or channel, under the assumption that new segments, etc., are inherently more exploratory and current segments, etc., are inherently more exploita-

tive. An alternative perspective from the organizational learning (e.g., Huber, 1991; March, 1991; Slater & Narver, 1995) and capabilities literatures (e.g., Day, 1994; Leonard-Barton, 1992; Prahalad & Hamel, 1990) suggests that the type of learning should be deduced from whether or not the firm does or does not rely on its current knowledge and skills or whether it must acquire new knowledge and skills. To understand the difference, consider a firm that targets a new segment but uses current knowledge and skills to do so. Is this firm exploring or exploiting? From a knowledge and skill perspective, the firm is more likely to be exploiting if the new segment allows the firm to improve or refine existing skills.

Our concepts of marketing exploitation and exploration therefore build on the resource-based view of the firm, which suggests that resources are combinations of knowledge, skills/competences, and routines (Amit & Schoemaker, 1993; Day, 1994; Leonard-Barton, 1992; Peteraf, 1993; Rumelt, Schendel, & Teece, 1991). More importantly, we share a focus on how to exploit firm-specific resources (Mahoney & Pandian, 1992) and at the same time develop new ones to deal with change (Barney, 1991; Wernerfelt, 1984). More recent developments in this stream describe the notion of dynamic capabilities, which enable "both the exploitation of existing internal and external firm-specific capabilities and developing new ones" (Teece et al., 1997, p. 515; Eisenhardt & Martin, 2000). As we will highlight shortly, we view a firm's market orientation as a dynamic capability that facilitates a firm's ability to explore and exploit knowledge and skills.

2.2. Tensions in marketing strategies

A great deal of organizational research has observed several well-known tensions between firms trying to engage in high levels of both exploitation and exploration. To begin, exploitation may limit exploration. Specifically, exploitation's reliance on established routines may retard adjustment to novel situations (Cyert & March, 1992) and foreclose the ability to perceive new strategic options (Day, 1999). Leonard-Barton (1992) describes this as a paradox—as core capabilities enhance product development, they may also evolve into core rigidities that limit innovation. Levitt and March (1988) refer to this tendency as "competency traps" and Levinthal and March (1993) call it a "success trap." In both cases, a firm's easy success at exploitation (because it is built on competence) reinforces current expertise and makes returns from exploration "less certain, more remote, and organizationally more distant from the locus of action and adaptation" (March, 1991, p. 73).

Second, exploitation can also lead companies to specialize in inferior routines because initial choices and associated revenue streams appear more favorable than do unselected or unexplored alternatives (Herriott, Levinthal, & March, 1985). Levinthal and March (1993) note that, in general, the short-term positive feedback associated with either exploitation or exploration can create "learning traps." Specifically, as firms adapt to successes in exploration or exploitation, they are likely to abandon a balance between the two approaches.

Third, because it involves experimenting with and often inventing new approaches, exploration is likely to impact firm efficiency. The short-term costs of exploration, in particular, are likely to be high as the firm acts without strong prior experience (Hutt, Reingen, & Ronchetto, 1988). Levinthal and March (1993) also note that firms engaging in exploration may experience a "failure trap" in which they spend too much time searching and experimenting to find a successful strategy and not enough time exploiting what they have learned.

Fourth, contingency theories claim that firms should adopt strategies consistent with the level of environmental uncertainty (e.g., Lawrence & Lorsch, 1967). This "external fit" logic suggests that firms operating in stable markets should rely on current knowledge and skills and run a more mechanistic organization. Alternatively, firms operating in turbulent markets should create new knowledge and skills and run a more flexible organization (e.g., Olson et al., 1995; Ruekert, Walker, & Roering, 1985).

Our last argument focuses on the poor "internal fit" of pursuing both strategies. Marketing and business strategy gurus, for example, have characterized firms that mix both strategies as "middle-of-the-roaders" (Kotler, 1994, p. 85), "stuck-in-the-middle" (Porter, 1980, p. 41), "reactors" (Mile, Snow, Meyer, & Coleman, 1978, p. 557), and firms "that are not particularly excellent at any thing" (Miller & Friesen, 1986, p. 42). Considering these tensions, Bierly and

Chakrabarti (1996, p. 124–125) argue, "... it is difficult to be successful at both because, besides the fact that there are limited resources, in general a different type of organizational culture and structure is needed for each of these types of learning."

2.3. Combinations of marketing strategies

Despite these tensions, both theoretical treatments (e.g., Levinthal & March, 1993; Lewin & Volberda, 1999) and business press advice (e.g., Markides, 1999) suggest that firms should both exploit and explore in order to increase their chances of long-term survival.

In response, we found only two papers that examine this mix of exploitation and exploration. In their study of the pharmaceutical industry, Bierly and Chakrabarti (1996) suggest that firms with high levels of both radical and incremental learning produce a higher return on sales, although closer examination reveals they did not measure exploitation activities. In their study of the computer industry, Eisenhardt and Tabrizi (1995) suggest that firms can utilize an "experiential strategy" while innovating. This strategy involves, in their words, "...rapidly building intuition and flexible options in order to learn quickly about and shift with uncertain environments. At the same time, it is also important to create structure and motivate pace in these settings, because the uncertainty can create paralyzing anxiety about the future" (Eisenhardt & Tabrizi, 1995, p. 91). This mix of structure and uncertainty parallels exploration and exploitation; however, their empirical work uses indirect approaches. To assess strategy, for example, they examine the number of design iterations tested by a product development team, the amount of time spent testing in the development process, the amount of time between milestones, and the power of the project leader.

Other research also considers the possibility of combining the two strategies. For example, firms can pursue each strategy at different points in time (the punctuated equilibrium model of Tushman & Anderson, 1986), in different business units (Mintzberg, 1979), or for different marketing tasks, such as marketing research, sales and distribution, and advertising and promotion (Ruekert et al., 1985). None of this research, however, has examined empirically how firms can utilize both approaches profitably within a *single* business unit during the course of the *same* project.

The next section argues that high levels of the two types of marketing strategies utilized in the same product development project can be mutually reinforcing and profitable. Relying on the concept of complementarity, we suggest that a firm's market orientation level will determine whether marketing exploitation (marketing exploration) improves the returns associated with marketing exploration (marketing exploitation) within a project. This approach of specifying a firm-level factor that moderates project-level variables is fairly common among studies attempting to discern how firms can successfully manage product development strategies and outcomes (e.g., Sethi, 2000; Sethi, Smith, & Park, 2001; Troy, Szymanski, & Varadarajan, 2001). Furthermore, meta-analysis points to the integration of project and firm-level factors as offering important insights for theory development and practice (Gerwin & Barrowman, 2002; Henard & Szymanski, 2001; Montoya-Weiss & Calantone, 1994).

3. Marketing strategy complementarities

Complementarity refers to the degree to which the value of an asset or activity is dependent on the level of other assets or activities. As Milgrom and Roberts (1990, p. 514) state, "The defining characteristic of ... complements is that if the levels of any subset of the activities are increased, then the marginal return to increases in any or all of the remaining activities rises" (see also Dierickx & Cool, 1989; Milgrom & Roberts, 1995; Moorman & Slotegraaf 1999). Therefore, a marketing strategy complementarity occurs when the returns associated with marketing exploitation strategies (marketing exploration strategies) increase in the presence of marketing exploration strategies (marketing exploitation strategies).

3.1. The role of market orientation

Following the literature, we view *market orientation* as: (1) a firm-level belief or unifying frame of reference that emphasizes serving the customer (Deshpandé et al., 1993; Homburg & Pflesser, 2000)

or understanding buyers' current and latent needs so as to create value for them (Narver & Slater, 1990; Slater & Narver, 1999); (2) a set of organization-wide processes involving the generation, dissemination, and responsiveness to intelligence pertaining to current and future customer needs (e.g., Jaworski & Kohli, 1993; Kohli & Jaworski, 1990; Kohli, Jaworski, & Kumar, 1993); and (3) a firm-level capability that links a firm to its external environment and enables the business to compete by anticipating market requirements ahead of competitors and by creating durable relationships with customers, channel members, and suppliers (Day, 1994).

Although market orientation seems to be closely related to exploitation and exploration, they are distinct concepts for several reasons. First, as explained before, market orientation is a firm-level trait whereas exploitation and exploration are project-level strategies. Therefore, we argue that a firm's market orientation creates the context within which project-level marketing strategies can cross-pollinate. Consistent with this, Slater and Narver (1995) argue that a market orientation provides *norms* for learning from customers and competitors but that it is distinct from adaptive or generative learning strategies. Second, as we will show, none of the current views of market or customer orientation are implicitly exploitation- or exploration-focused. Therefore, this element must be accounted for by additional strategic factors in the firm and in our model (see also Day, 1999; Slater & Narver, 1999). Each view of market orientation is now discussed for its potential to create a complementarity.

3.1.1. Unifying frame of reference

One important way in which a market orientation facilitates a marketing strategy complementarity is by providing a unified way of perceiving and interpreting marketing exploration and marketing exploitation. This frame focuses on the common goal of serving the customer, which increases the likelihood that insights, information, and processes associated with one strategy approach facilitate the other. In practical terms, this might occur when marketing exploitation activities produce customer insights that are used in product development efforts. Similarly, this might occur when exploration activities produce customer insight that is used to refine exploitation efforts in current business domains. In both cases, the unified emphasis on serving the customer provides team members with a way of interpreting exploitation and exploration activities so that outputs have the opportunity to cross-pollinate.

There is strong support for the idea that a common frame of reference can facilitate a firm's ability to manage diverse and even conflicting information and strategies. For example, Fiol (1994) found that the successful launching of a large financial services firm's new venture was highly dependent upon the new venture team reaching consensus about how to frame conflicting information (see also Frankwick, Ward, Hutt, & Reingen, 1994). Dougherty (1990, p. 73) likewise observes that successful project teams are those firms that have developed a cognitive frame which she terms a "market definition."

The unified focus on customers also mitigates two tensions between exploitation and exploration. First, recall that firms using an exploitation strategy may have a tendency to become very focused and rigid. These firms may therefore lose touch with customers' changing needs. In a market-oriented firm, customer-focused goals attenuate this tendency because they continually push project teams to consider new customers and new ways of satisfying existing customers.

A second tension involves the tendency for project teams that are good at exploration to neglect the potential of the learning curve, which reduces their ability to extract rents from new discoveries (e.g., Bierly & Chakrabarti, 1996). Because of this, strong explorers often pave the way for imitators who outperform them (Levinthal & March, 1993; Teece, 1986). In a market-oriented firm, the unified focus on customer outcomes increases the likelihood that project teams will work hard to find the commercialization potential of new knowledge coming from R&D.

3.1.2. Organization-wide information processes

A market orientation may also be viewed as the organization-wide acquisition, dissemination, and utilization of customer-related information (Jaworski & Kohli, 1993; Kohli & Jaworski, 1990; Kohli et al., 1993). Using this perspective, we envision several ways in which a market orientation facilitates a complementarity of marketing exploitation and mar-

keting exploration strategies. As noted before, organization-wide market information processes ensure that customer insights produced as a result of exploitation are disseminated to the parts of the organization that can utilize them in innovation activities.

Likewise, a market-oriented firm should be more likely to exploit exploration paths with the greatest potential. RCA, for example, experimented with alternative video technologies. However, because its engineers were isolated from market trends and competitors' innovations, the company's product only played videotapes. RCA missed the fact that customers wanted to record and watch programs (Hamel & Prahalad, 1991). JVC and Sony both obtained customer feedback to early ideas, which allowed their engineers to exploit a more profitable play-and-record form of the innovation.

Organization-wide processes that focus on the market also decrease the likelihood that either exploitation or exploration will create learning traps (Levinthal & March, 1993). Specifically, organization-wide processes for acquiring and distributing market information ensure that strategies remain more responsive to experiences, inputs, and initiatives generated by managers across functions (e.g., Kohli & Jaworski, 1990; Narver & Slater, 1990).

3.1.3. Dynamic market linking capability

Strategy researchers are increasingly focusing on a "firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997, p. 517). This focus on a firm's dynamic capabilities means that researchers tend to emphasize the accumulation, mobilization, and deployment of knowledge and skills over more traditional balance sheet assets (Srivastava, Shervani, & Fahey, 1998, 1999).

Consistent with this view, Day (1994) portrays market orientation as a firm-level dynamic capability that links a firm to its external environment. He distinguishes *outside-in capabilities* (market sensing, customer linking, and channel bonding capabilities) from *inside-out capabilities* (cost control, financial management, technology development, human resources management, and manufacturing processes). Day also suggests that a series of *spanning capabilities* (strategy development, product development, price setting, purchasing, and customer order fulfillment) is needed to integrate outside-in and inside-out capabilities. He notes that "...[M]arket-driven organizations have superior market sensing, customer linking, and channel bonding capabilities" and that insights gained from these processes should "inform and guide both spanning and inside-out capabilities" (Day, 1994, p. 41).

Using this perspective, we see several ways in which marketing strategy complementarities may be achieved. First, if outside-in processes inform and guide other processes, a firm's exploitation and exploration activities will share common customer goals and information. Second, a market-oriented firm should systematically link its exploitation and exploration strategies to determine the most effective and efficient way to relate to customers. Winter and Szulanski (2001), for example, examine what they term the "replication" approach to strategy. They demonstrate that this approach, which involves the creation and operation of a large number of similar outlets to deliver a standardized product, actually involves a strong exploration effort to uncover and develop the best business model.

Day's (1994) inclusion of market sensing as one of a firm's outside-in capabilities offers additional insight into the development of marketing strategy complementarities. Specifically, market sensing involves the "ability of a firm to learn about customers, competitors, and channel members in order to continuously sense and act on events and trends in present and prospective markets" (Day, 1994, p. 43). According to Day, market sensing relies on organizational memory (stored knowledge and mental models) to facilitate the acquisition and interpretation of incoming market information. An organization disseminates and utilizes this information to facilitate strategic action, then evaluates that action and updates its organizational memory after observing the outcome.

This process view of market sensing offers several opportunities to consider the way in which market orientation may facilitate a complementarity of marketing exploitation and exploration. First, when existing organizational memory is exploited by a project team during the interpretation of incoming market information, it provides a degree of structure for exploration. This structure can negatively impact exploration if it screens out novel ideas (Leonard-

Barton, 1992; Moorman & Miner, 1997). There is, however, an emerging consensus that structure is crucial for innovation. Specifically, senior management control (Imai, Nonaka, & Takeuchi, 1985), strategic vision (Hamel & Prahalad, 1991), and priorities (Brown & Eisenhardt, 1997) have been described as helping product teams stay focused on innovative objectives and avoid chaos and procrastination (Weick, 1993).

Second, existing organizational memory may also complement exploration by increasing the opportunity for innovation. Building on Pasteur's classic observation, Cohen and Levinthal (1994, p. 227) remind us that "Fortune favors the prepared firm" and Powell and Brantley (1992, p. 368) note that "[I]nnovation builds on existing know-how." In support of this idea, Cohen and Levinthal (1990) find that existing R&D knowledge structures increase a firm's "absorptive capacity" or the ability to innovate. Likewise, Pennings and Harianto (1992) find that a bank's current technological knowledge and routines predict its propensity to innovate in the adoption of videotext. Finally, Hutt et al. (1988) argue that shared knowledge structures increase an organization's level of creative new product initiatives (see also Madhavan & Grover, 1998; Moorman & Miner, 1997).

3.2. Predictions

To summarize, research describes the need for, but inherent tension contained within, the simultaneous pursuit of both marketing exploitation and exploration strategies within a single product development project. We suggest that a firm's market orientation can facilitate their complementarity by providing a common frame of reference focused on customer goals, by facilitating organization-wide processes that facilitate market information flows between the two strategies, and by serving as a dynamic market linking capability that integrates the two strategies during the project.

Given that the defining characteristic of complements is an increase in returns accruing from the joint pursuit of two activities (e.g., Moorman & Slotegraaf, 1999), we focus on the financial performance resulting from marketing exploitation and marketing exploration within the project. Specifically, we examine the financial performance of the new product resulting from the project.

Therefore, our framework predicts that firms can benefit from utilizing strategies that are high in both marketing exploration and exploitation in the presence, but not in the absence, of a strong market orientation. In the absence thereof, high levels of marketing exploration and exploitation result in the tensions and tradeoffs previously discussed. We predict:

H1. When market orientation is *high*, firms engaging in *high* levels of both marketing exploitation and marketing exploration strategies will have strong new product financial performance.

H2. When market orientation is *low*, firms engaging in *high* levels of both marketing exploitation and marketing exploration strategies will have weak new product financial performance.

4. Methods and measures

4.1. Research setting

A sample of 500 Dutch business units from the food processing industry (i.e., producers of packaged foods) was randomly selected from the Quic BV business directory, which contains a complete list of Dutch companies. One hundred and sixty firms that did not engage in product development activities (i.e., retailers and distributors) were eliminated resulting in a sample of 340 firms. Although our choice of a single industry limits the generalizability of our results, this choice also reduces problems that arise when sampling firms from different industries. Specifically, different industries increase extraneous sources of variance and thus require the inclusion of many interindustry factors to account for heterogeneity of estimates (Bass, Cattin & Wittink, 1978). In addition, although the food industry is low in R&D intensity, product innovation and market orientation play an increasingly important role in profitability and growth due to the biotechnology revolution, emerging issues in food safety, new science in nutritional quality, and the ever-changing variety-seeking behavior of consumers (Alfranca, Rama, & von Tunzelmann, 2002; Traill & Meulenberg, 2002). We do acknowledge, however, that compared to highly

innovative sectors (e.g., electronics, pharmaceuticals), the food industry is only moderately innovative (Alfranca et al., 2002).

The vice president of marketing of each business unit was selected as the key informant and was mailed a questionnaire, a letter explaining the purpose of the study and requesting participation, and a monetary incentive. Informants were promised a summary of the results if they returned their business cards with the completed questionnaire. A reminder postcard with a duplicate questionnaire was mailed approximately 3 weeks after the first mailing. Two weeks following the second mailing, non-respondents were telephoned and encouraged to complete and return the questionnaire. A chi-square difference test found no systematic differences between those responding before and after the second mailing, reducing concerns about non-response bias (Armstrong & Overton, 1977). Comparing early respondents (ER) to late respondents (LR), no differences were found: financial performance during year one (ER=4.66, LR=4.50, $t_{(83)}$=0.47, *n.s.*), marketing exploitation (ER=3.60, LR=3.58 , $t_{(91)}$=−0.08, *n.s.*), marketing exploration (ER=2.56, LR=2.46, $t_{(91)}$=−0.69, *n.s.*), market orientation (ER=4.92, LR=5.13, $t_{(83)}$=0.47, *n.s.*), and firm resources (ER=4.48, LR=4.16, $t_{(91)}$=0.92, *n.s.*). Of the 340 respondents, 96 returned the questionnaire for a response rate of 28.3%.

One year later, those 96 respondents were mailed a questionnaire focusing on financial performance outcomes associated with the project. This mailing generated 75 responses for a 78% response rate. There were no systematic differences between firms that responded to the first mailing (FM, n=96) and those that responded to the second mailing (SM, n=75): financial performance during year one (FM=4.56, SM=4.76, $t_{(84)}$=0.41, *n.s.*), marketing exploitation (FM=3.64, SM=3.57, $t_{(91)}$=0.36, *n.s.*), marketing exploration (FM=2.543.92, SM=2.40, $t_{(91)}$=−0.69, *n.s.*), market orientation (ER=4.99, LR=5.23, $t_{(83)}$=1.04, *n.s.*),and firm resources (FM=4.27, SM=4.72, $t_{(91)}$=1.05, *n.s.*). Given these results, we have no concerns about selection biases.

Informants were asked to focus on a product development project that had been completed in the last 12 months. Although one might argue that product development is, by definition, an exploration approach, it is well known that a great deal of product development involves line extensions or simple product upgrades that target existing markets using current firm positions and channels (Booz, Allen, & Hamilton, 1982; Griffin, 1997). This would seem to indicate that product development is one area where we may observe the effects of both exploration and exploitation. Product development did yield a variety of project types as rated by respondents. When asked to identify the nature of the project, 17% described it as a completely new product with a new market, 24.5% as a new product line, 38.3% as an addition to an existing line, 9.6% as a repositioning of an existing product, and 10.6% as an improvement of an existing product. Our distribution of projects along the various categories is similar to other research examining innovation in food companies (e.g., Hultink, 1997). Henard and Szymanski's (2001) meta-analysis shows that compared to objective measures, subjective measures of product innovativeness produce similar effects on new product performance.

4.2. Measures

4.2.1. Marketing strategy approaches

Measures of marketing exploitation and exploration strategies were not available in the literature, so we developed our own using both formative and reflective measurement approaches. A reflective approach involves constructs that are reflected by several indicators and a formative approach involves indicators that form or cause the construct (Diamantopoulos & Winklhofer, 2001). In a structural model, the arrows run from construct to indicators for reflective scales and from indicators to construct for formative scales (Bagozzi, 1994; Bollen & Lennox, 1991).

Marketing exploitation and exploration are formative because the strategies are caused by exploitation or exploration in each strategic marketing decision (e.g., segmentation, positioning). Accordingly, we first generated 16 indicators that could meaningfully constitute the strategy approaches. These were presented to academic experts who judged their precision and representativeness. Using that feedback, we revised the items to enhance their clarity and administered them to 10 marketing managers whose responses were used for further modification (see the Appendix).

In the final measures, informants were instructed to consider how their division planned and implemented a product development project. Using our focus derived from the organizational learning and capabilities literature, our measures examined the project team's reliance on new or current knowledge, skills, and procedures—not merely the newness of the marketing strategy. To evaluate marketing exploitation, informants were asked to rate the extent to which, "During this project, we improved our prior skills and procedures with respect to each of the following areas." Exploitation is measured as an "improvement" in marketing skills and procedures because the focus for exploitation is not merely whether a firm leverages current marketing strategies but whether the ensuing skills and procedures are improved (March, 1991). The areas of evaluation included: targeting and segmentation, product positioning and differentiation, product distribution, product design, product quality, pricing, and promotion. These areas fit our domain because they address strategic-level activities and focus on important marketing-related activities in the project.

Informants were later asked to evaluate marketing exploration by rating the extent to which, "During this project, we challenged and/or changed our prior thinking with respect to each of the following areas. " The areas again included: targeting and segmentation, product positioning and differentiation, product distribution, product design, product quality, pricing, and promotion. Although it is possible to evaluate marketing exploration by rating the extent to which skills and procedures are changed, following the literature, we consider the most fundamental form of marketing exploration to be challenging the "mental model" of the firm's interaction with the market (Argyris & Schön, 1978; Day & Nedungadi, 1994; Slater & Narver, 1995). In addition, early pretesting indicated that managers tended to underreport market exploration if it were built even indirectly on a small set of existing firm skills—which is typically the case even in the most innovative forms of exploration (Nelson & Winter, 1982). Managers also tended to see new behavior as exploratory when it was simply a minor extension of their current approaches. Using the criteria of "challenged and/or changed our prior thinking" gave managers a clearer basis for evaluating exploration, which reduced both of these tendencies.

4.2.2. Financial performance outcomes

Given our interest in the complementarity of the marketing strategy approaches, we measured the financial performance of product development activities at two distinct points of time. *New product financial performance during year one* examines new product sales, market share, and profit margin outcomes relative to a firm's major competitor during the first year after launch. *New product financial performance during year two* examines these same outcomes during the second year after launch. Measuring performance as the success of a firm relative to its most competitive rival eliminates variance and distortion created by product/market differences.

4.2.3. Market orientation

Market orientation was measured using Jaworski and Kohli's (1993) 20-item scale validated in Kohli et al. (1993). Although debate continues about the measurement of market orientation (Deshpandé, 1999), we believe that this scale taps the mechanisms about which we theorize, including the unifying frame of reference of a market orientation, the associated information-processing and utilization activities inherent in a market orientation, and the dynamic capabilities' view of market orientation. In addition, prior research has concluded that the scales are essentially interchangeable (Deshpandé, 1999). Finally, given our use of key informants, it was impossible to measure all forms of market orientation despite our desire to do so.

4.2.4. Control variables

We control for the size of a business unit's resource level to rule out the possibility that large size contributes to the complementarity. This was measured by asking informants to compare their R&D resources to those of their competitors. We also control for the type of the product development project with an ordinal scale ranging from a completely new product and new market, a new product line, an addition to an existing line, the improvement of existing product, the repositioning of an existing product, and an existing product produced at lower cost.

We also collected information to account for other competing explanations, including measures of four

different organizational cultures and three forms of environmental turbulence. We did not include these measures in the final model, however, because their inclusion did not change our results, they did not contribute to the explanatory power of the model, and the ratio of sample size to parameter estimates was not optimal when they were included.

4.2.5. Common method bias test

Because the dependent and independent variables were obtained from a single key informant, we tested for common method bias using the Harman one-factor test (see Podsakoff & Organ, 1986). The result of the principal components factor analysis revealed seven factors with eigenvalues greater than 1.0, which correspond to the seven variables in our model (i.e., marketing exploitation, marketing exploration, market orientation, financial performance during year one, financial performance during year two, firm resource level, and project type). Furthermore, because results indicated that there is no general factor in the unrotated factor structure, there does not appear to be a common method bias concern. We also performed the same test on pairs of independent and dependent variables and always found that the test produced two distinct factors.

4.3. Measure purification

Two types of analysis were used to purify the scales. For our *formative scales* (exploitation and exploration marketing strategies), we followed the recommendations of Bollen and Lennox (1991) and Diamantopoulos and Winklhofer (2001) to examine indicator collinearity and external validity. Indicator collinearity is important because it affects the stability of indicator weights as derived from a principal component model (Diamantopoulos & Winklhofer, 2001). To assess item collinearity, we ran a regression analysis of all items (as independent variables) on each single item (dependent variables), and we found that three items (product quality, pricing, and promotion) had high multicollinearity with the product-positioning item. According to convention (Bollen & Lennox, 1991; Diamantopoulos & Winklhofer, 2001), these three items were deleted.

We also assessed external validity[2] or nomological validity by examining the correlations of our remaining items with two sets of variables that are distinct from, but theoretically related to, our marketing strategy approaches. First, we measured firm innovativeness strategy by asking informants to rate the extent to which their firm was "first in new market areas." Consistent with our expectations, the marketing exploration indicators are all positively correlated with the firm innovativeness strategy ($\rho>0.15$, $p<0.05$), while marketing exploitation indicators are not correlated with the firm innovativeness strategy ($\rho<0.12$, *n.s.*). Second, we measured project-level memory by asking informants to rate the extent to which "for this project, the team relied on well-defined procedures" (Moorman & Miner, 1997). Consistent with our expectations, project-level memory is positively correlated with the marketing exploitation indicators ($\rho>0.16$, $p<0.10$) but not with marketing exploration indicators ($\rho<0.13$, *n.s.*).

Turning to our *reflective scales*, we first ran two confirmatory factor models—one for market orientation and one for the two financial performance outcomes. We encountered some problems in the market orientation scale due to its length (Bagozzi & Baumgartner, 1994) and reverse-scored items (Herche & Engelland, 1996). Following Grewal and Tansuhaj (2001), we deleted items with large modification indices (see Appendix). Doing so does not appear to reduce domain coverage. Overall, results demonstrate adequate levels of fit for the market orientation model ($\chi^2_{(62)}=93.3$, NNFI=0.89, CFI=0.94, SRMR=0.077, RMSEA=0.064) and the financial performance model ($\chi^2_{(24)}=108$, NNFI=0.90, CFI=0.91, SRMR=0.065, RMSEA=0.10). The latter has a smaller sample size because it utilizes the longitudinal data. In addition, the average variance extracted by each measure exceeded the recommended cutoffs (Bagozzi & Youjae, 1988), which together with the high reliabilities evinced by all three measures (see Table 1), establishes their internal consistency.

[2] To establish external validity for formative scales, each indicator should be correlated to another variable (external to the index), and only those indicators that are significantly correlated with the variable of interest would be retained (Diamantopoulos & Winklhofer, 2001, p. 272).

Table 1
Measure characteristics and correlation matrix[a]

	Mean	S.D.	1	2	3	4	5	6
1. Marketing exploitation strategies	3.60	0.67	[b]					
2. Marketing exploration strategies	2.49	0.77	0.26*	[b]				
3. Market orientation	5.03	0.87	0.34*	0.10	*(0.82)*			
4. New product financial performance during year one	4.59	1.50	0.21*	−0.12	0.34*	*(0.88)*		
5. New product financial performance during year two	4.71	1.31	0.15	−0.05	0.27*	0.62*	*(0.84)*	
6. Firm resource level	4.33	1.46	−0.02	0.07	0.17*	0.24*	0.21*	[c]

Note: The alpha associated with multi-item reflective measures is on the diagonal and in parentheses and in italics.
[a] Correlations for the variable project type are not included due to its *categorical* nature.
[b] Formative scale—therefore, no reliabilities reported.
[c] Single-item measure—therefore, no reliability reported.
* $p<0.05$.

We conducted a final set of analysis to assess the discriminant validity of both our formative and reflective scales. Because the literature is silent on how to assess discriminant validity between these scales, we decided to follow conventional tests (Steenkamp & van Trijp, 1991). Examining first the correlation matrix (Table 1), the correlations did not appear to suggest problems of discriminant validity. We then paired each marketing strategy approach with all other variables used in our models in a series of two-factor models using LISREL 8.3 (Jöreskog & Sörbom, 1999). Each model was run twice, first constraining the correlation between the two latent variables to unity and then freeing this parameter. Results provide evidence of discriminant validity.[3] Discriminant validity is also indicated by the fact that all φ[phi]s are statistically different from 1 (Anderson & Gerbing, 1988). Finally, following Fornell and Larcker (1981), we found that the average variance extracted for each construct (the two marketing strategy approaches, market orientation, and the two new product performance outcomes) is higher than the squared correlation between the construct and any other construct.[4]

4.4. Analysis approach

To examine the moderating effect of market orientation on the complementarity of marketing exploitation and exploration strategies, we used two tests. First, we utilized a three-step hierarchical linear regression model with new product financial performance during year one or two as dependent variables. Step 1 contained the two marketing strategies, market orientation, and the control variables (firm resource level and project type). Step 2 contained the two-way interactions of marketing exploitation and marketing exploration, marketing exploitation and market orientation, and marketing exploration and market orientation. Finally, Step 3 contained the three-way interaction of marketing exploitation, marketing exploration, and market orientation. All variables were mean-centered before forming interactions to avoid multicollinearity. Variance inflation factors were estimated to examine collinearity levels and found to be below harmful levels (Mason & Perreault, 1991). Following standard practice, interactions were considered only if the Change-in-F associated with their entry was significant.

Second, planned contrasts consistent with our predictions were then used to examine the three-way interaction in more depth utilizing procedures recommended by Aiken and West (1991), Irwin and

[3] Results indicate that the critical value ($\Delta\chi^2_{(1)}$=3.84, p<.05) was exceeded in all tests: marketing exploration and marketing exploitation ($\Delta\chi^2_{(1)}$=49.02); marketing exploration and market orientation ($\Delta\chi^2_{(1)}$=117.84); marketing exploitation and market orientation ($\Delta\chi^2_{(1)}$=16.82); marketing exploitation and performance during year one ($\Delta\chi^2_{(1)}$=110.45); marketing exploitation and performance during year two ($\Delta\chi^2_{(1)}$=64.66); marketing exploration and performance during year one ($\Delta\chi^2_{(1)}$=292.83); marketing exploration and performance during year two ($\Delta\chi^2_{(1)}$=49.55); market orientation and performance during year one ($\Delta\chi^2_{(1)}$=191.70); market orientation and performance during year two ($\Delta\chi^2_{(1)}$=139.70); and performance during year one and year two ($\Delta\chi^2_{(1)}$=54).

[4] The squared correlations (ranging from .003 to .25) do not exceed the average variance extracted (ranging from .51 to .63), suggesting discriminant validity.

McClelland (2001), and Jaccard, Turrisi, and Wan (1990).

5. Results

5.1. Regression results[5]

5.1.1. Financial performance effects during year one

Results indicate that Step 1 predictors accounted for a significant amount of variance in financial performance (R^2=0.18, $F_{(5,78)}$=3.38, p<0.05). Step 2 results were not significant (Change-in-$F_{(8,75)}$=0.37, *n.s.*). The Step 3 result involving the three-way interaction of marketing exploitation, marketing exploration, and market orientation was significant (Change-in-$F_{(9,74)}$=5.09, p<0.05). As noted in Table 2, two simple effects[6] were significant in the final model—market orientation (b=0.49, p<0.05) and marketing exploration (b=−0.50, p<0.05)—as well as the predicted three-way interaction of marketing exploitation, marketing exploration, and market orientation (b=0.58, p<0.05).

5.1.2. Financial performance effects during year two

Turning to financial performance during year two and using the same model-testing approach, results indicate that Step 1 predictors accounted for a moderately significant amount of variance (R^2=0.13, $F_{(5,63)}$=1.88, p<10.). Step 2 results involving the two-way interactions were not significant (Change-in-$F_{(7,61)}$=0.87, *n.s.*). Step 3 involving the introduction of the three-way interaction of marketing exploitation, marketing exploration, and market orientation was significant (Change-in-$F_{(9,59)}$=5.64, p<0.05). As noted in Table 2, two simple effects were significant—marketing exploration (b=−0.33, p<0.10) and project type (b=0.72, p<0.05)—and the interaction[7] of marketing exploitation and market orientation (b=0.77, p<0.05). The three-way interaction of marketing exploitation, marketing exploration, and market orientation (b=0.58, p<0.05) was also significant.

We completed our general model testing by examining whether our results varied when we relied on the three facets of market orientation—intelligence generation, intelligence dissemination, and market responsiveness. Results from Step 3 indicate that the three-way interaction remained significant for all three dimensions across the two types of performance. Finally, given our reliance on a limited version of the MARKOR scale, we also ran the same regression analyses utilizing the *complete* scale. Findings are consistent with the results of our regression analyses described above.

5.2. Post hoc probing of the significant three-way interactions

5.2.1. General modeling approach

We use procedures recommended by Aiken and West (1991), Irwin and McClelland (2001), and Jaccard et al. (1990) that retain the data in their

[5] Given its common usage, we also examined the impact of market orientation on the exploration–exploitation complementarity by creating a median split of market orientation. We then estimated the effect of exploration* exploitation on performance in a sample of high market orientation firms (above the median) and low market orientations (below the median). Findings are consistent with the results of the regression and post hoc probing described here. Specifically, for performance during year one, the interaction of exploration and exploitation was positive for high market orientation firms (b=.59, p<.05), but negative for low market orientation firms (b=−1.017, p<.01). The same pattern is observed for performance during year two for high market orientation firms (b=.63, p<.05) and low market orientation firms (b=−1.01, p<.01).

[6] It is important to note that the individual effects of market orientation or market exploration can not be interpreted as main effect results. Instead, in a *mean-centered* interaction effects model, these effects are referred to as "simple effects" and reflect the effect of each variable when the other variables in the model are at their mean level (which is zero in this model) (Aiken & West 1991; Jaccard et al., 1990; Irwin & McClelland, 2001). As we will show in our probing of the three-way interactions, the benefit of this insight about the simple effects is that it allows researchers to use post hoc probing to put the spotlight on the how one variable (z) is affecting the effect of another (x) on some outcome of interest (y). Although we have a three-way interaction, we engage in a similar approach in Table 3. The downside of this approach is that the effects of the individual variables can not be interpreted as main effects. However, given our hypotheses focus only on the three-way interaction, the fact that we can not directly interpret the main effects is not problematic to the theory test.

[7] Following the same logic, this effect is not simply the two-way interaction of exploration and exploitation. Rather, it is the simple interaction of exploration and exploitation when market orientation is at the mean level.

Table 2
The impact of marketing exploration and marketing exploitation strategies on new product financial performance

	New product financial performance during year one		New product financial performance during year two	
Step 1 (Main effects)				
Total R^2	0.18		0.13	
F level (P value)	3.38, $p<0.05$		1.88, n.s.	
Degrees of freedom	(5,78)		(5,63)	
	b	***p***	***b***	***p***
Marketing exploitation strategy (Exploit)	0.26	0.30	0.13	0.28
Marketing exploration strategy (Explore)	−0.32	0.12	−0.17	0.40
Market orientation (MarkOr)	0.44	0.02	0.26	0.17
Project type	0.36	0.25	0.60	0.05
Firm resources	0.15	0.13	0.08	0.45
Step 2 (Main effects and two-way interactions)				
Change-in-R^2	0.01		0.05	
Change-in-F (P value)	0.37, n.s.		0.87 n.s.	
Degrees of freedom	(8,75)		(8,60)	
	b	***p***	***b***	***p***
Exploit	0.34	0.23	0.10	0.71
Explore	−0.35	0.09	−0.26	0.21
MarkOr	0.44	0.03	0.27	0.16
Project type	0.29	0.38	0.68	0.03
Firm resources	0.16	0.13	0.07	0.46
Explore*MarkOr	0.18	0.24	−0.39	0.17
Exploit*MarkOr	−0.28	0.47	0.52	0.09
Explore*Exploit	0.02	0.96	0.03	0.92
Step 3 (Main effects, two-way, three-way)				
Change-in-R^2	0.05		0.07	
Change-in-F (P value)	5.09, $p<0.05$		5.64, $p<0.05$	
Degrees of freedom	(9,74)		(9,59)	
	b	***p***	***b***	***p***
Exploit	0.29	0.30	0.08	0.32
Explore	−0.50	0.02	−0.33	0.09
MarkOr	0.49	0.02	0.22	0.40
Project type	0.27	0.40	0.72	0.04
Firm resources	0.15	0.14	0.08	0.35
Explore*MarkOr	0.29	0.24	−0.22	0.34
Exploit*MarkOr	0.06	0.84	0.77	0.02
Explore*Exploit	−0.10	0.54	−0.16	0.70
Explore*Exploit*MarkOr	0.58	0.03	0.58	0.02

original continuous form. As Irwin and McClelland (2001, p. 106) note, "…a spotlight is focused on the model from different angles" by using statistical techniques. The "spotlight" in turn allows for a deeper understanding of the interrelationships between different levels and combinations of the independent variables on the dependent variable. The advantage of these procedures is twofold—they do not reduce statistical power and they reduce the likelihood of spurious relationships (Irwin & McClelland, 2001).

Beginning with our regression model, we abbreviate: financial performance during year one or two (performance), marketing exploitation

Table 3
Post hoc probes of significant three-way interactions

Condition	Focal parameter	New product financial performance during year one *b*	New product financial performance during year two *b*
A. The performance effects of marketing exploration when marketing exploitation is high			
Step 1: High exploit	b_6Explore*MarkOr	1.11*	0.60***
Step 2: High exploit and high MarkOr	b_2Explore	1.21**	0.48***
Step 3: High exploit and low MarkOr	b_2Explore	−2.66*	−1.59**
B. The performance effects of marketing exploitation when marketing exploration is high			
Step 1: High explore	b_4Exploit*MarkOr	1.04**	1.75*
Step 2: High explore and high MarkOr	b_1Exploit	1.81**	2.85*
Step 3: High explore and low MarkOr	b_1Exploit	−1.81***	−3.24*

Note: We utilized one-tailed tests because our predictions are directional in nature.
* $p<0.01$.
** $p<0.05$.
*** $p<0.10$.

(exploit), marketing exploration (explore), and market orientation (markor):[8]

$$\text{Performance} = b_1\text{exploit} + b_2\text{explore} + b_3\text{markor} + b_4\text{exploit*markor} + b_5\text{exploit*explore} + b_6\text{explore*markor} + b_7\text{exploit*explore*markor} + b_0$$

Because we have two marketing strategies, we performed this post hoc probing by using exploitation or exploration as a starting place. To simplify our description, we focus here on changing levels of exploitation (see Table 3, part A). Table 3 (part B) contains model estimates focusing on changing levels of exploration. Results show the same pattern of results regardless of the starting place.

The probing involved three steps (see Aiken & West, 1991, pp. 56–58). First, we created a high level of exploitation two standard deviations above the mean-centered main effect. Using this high level of exploitation, we reestimated our model and examined the significance of the exploration–market orientation interaction (b_6). This told us whether there is a simple interaction between exploration and market orientation when exploitation is high. Results indicate that the interaction is significant for financial performance measures during year one (b=1.11, $p<0.01$) and year two (b=0.60, $p<0.10$).

Next, given this significant interaction, we shifted our attention to the effect of changing levels of market orientation. Given our already high level of exploitation, we created a high level of market orientation two standard deviations above the mean-centered main effect and reestimated the model. This approach allowed us to examine whether, for a high market orientation firm, exploration improves performance when exploitation is already high. Therefore, the focus is now on the effect of exploration (b_2). Results indicate that b_2 is positive and significant for both performances during year one (b=1.21, $p<0.05$) and year two (b=0.48, $p<0.10$). This means that for a firm with a high level of market orientation, exploration has a positive effect on performance when exploitation is high. These results support H1.

We completed our post hoc probing on the third step by examining the effect of exploration when exploitation is high and market orientation is low. This allows us to examine whether, for a low market orientation firm, increasing levels of exploration hurt performance when exploitation is already high. To examine this, we constructed a low level of market orientation (two standard deviations below the mean-centered main effect)

[8] To simplify our description, we did not depict our control variable in the post hoc probing models; however, mean-centered versions of each control variable were included in each of the models.

and reestimated the model. Results indicate that b_2 is now negative and significant for both financial performance during year one ($b=-2.66$, $p<0.01$) and year two ($b=-1.59$, $p<0.05$). This means that for a firm with a low level of market orientation, exploration has a negative effect on performance when exploitation is high. These results support H2 and suggest that low market orientation firms do not optimize performance when they pursue both exploitation and exploration strategies.

6. Discussion

Our research objective was to examine whether the market orientation of a firm influences the degree to which project-level marketing exploitation and exploration strategies can operate in a complementary fashion to increase new product financial performance. Our findings support the idea that market-oriented firms can gain important bottom-line benefits from pursuing high levels of both strategies in product development. We now discuss the implications of our findings for extending the literature, suggest future research directions, and describe study limitations.

6.1. Theoretical implications

Our results have important implications for the general business strategy and marketing strategy literatures which argue that firms should *not* pursue exploitation and exploration within the same firm at the same time because there is considerable loss to both firm synergy and fit with the environment. Our results challenge these traditional views, as we found that high market orientation organizations can indeed benefit from pursuing these seemingly contradictory strategies. Hence, this study joins an emerging body of literature that suggests a more complex, dynamic, and paradoxical view of strategy (Brown & Eisenhardt, 1997; Quinn, 1988; Weick, 1993). According to this newer view, strategic fit results from the duality of strategies and the coexistence of extremes—not by choosing one or other. As Eisenhardt (2000, p. 703) notes, "This duality of coexisting tensions creates an edge of chaos, not a bland halfway point between one extreme and the other. The management of this duality hinges on exploring the tension in a creative way that captures both extremes. . .".

Our findings also relate to product development research, which has examined the role of market orientation and marketing synergies (e.g., Atuahene-Gima, 1995; Danneels & Kleinschmidt, 2001; de Brentani, 1995; Henard & Szymanski, 2001; Song & Parry, 1997). While these studies have offered important insights into the role of each factor independently, our findings extend this research by painting a more dynamic view of strategy within the same product development project. Furthermore, our approach extends this literature by focusing on the degree to which the new product strategy relates to firm knowledge and skills—instead of the newness of the marketing strategies per se.

Our work has implications for research on the role of competences (e.g., Prahalad & Hamel, 1990) and capabilities (Day, 1994) and its broader theoretical basis, the resource-based view (Barney, 1991; Slotegraaf, Moorman, & Inman 2003; Wernerfelt, 1984). While this research has also recognized that dynamic capabilities build concurrently on leveraging existing skills and developing new ones (Teece et al., 1997), our study is the first one, to our knowledge, to examine this issue in the marketing strategy context and specify a firm-wide factor that helps firm integrate these strategies.

Slater and Narver's (1999) provocative defense of the market orientation literature has implications on our findings as well. Pointing to the fact that some research equates market orientation with a firm being "customer-led," which is reactive and focuses on meeting well-established customer needs (e.g., Christensen & Bower, 1996), they note that market orientation can be either adaptive or generative (see Slater & Narver, 1995). Our approach is not inconsistent with their conclusions. However, in our research, we do not locus the emphasis on exploitation and exploration within market orientation itself. Instead, we separate out this element so we can understand market orientation's effect on the adaptive or generative nature of the firm's strategy.

Our study strengthens this literature by reaffirming that norms for serving expressed and latent customer needs do not, therefore, lead to marketing myopia. Instead, such norms create a context within which firm members can integrate marketing strategies. In addi-

tion, a market orientation appears also to broaden a firm's options by allowing the best business opportunities offered from each marketing strategy to permeate the firm's consideration set. Finally, as a dynamic capability to sense market changes and relate to markets, a firm's market orientation helps it reconfigure and integrate knowledge generated from both strategies to serve existing and future customer needs.

Our findings also extend literature in the organizational sciences, which has argued that most firms fail to balance exploitation and exploration approaches. We offer insight into an important organizational design factor—a firm's market orientation—that shows some promise of increasing a firm's ability to achieve this critical balance. Prior research describing the "ambidextrous firm" (Tushman & O'Reilly, 1996) points to rhythmic switches between mechanistic and organic structures (see also Brown & Eisenhardt, 1997; Miner, Bassoff, & Moorman, 2001). Market orientation is one concrete factor that fosters this type of integration. While extending this literature, our results are also remarkably consistent with the general view that pursuing exploitation and exploration simultaneously is problematic for most organizations. Specifically, in the low market orientation condition, our findings indicate that high levels of exploitation and exploration result in weaker financial performance.

Finally, our study provides two method advantages not commonly found in the marketing, strategy, and organizational literatures. First, our paper is among a handful of papers that has attempted to examine exploitation and exploration empirically. Second, our longitudinal approach also overcomes some method considerations related to cross-sectional research.

6.2. Future research directions and study limitations

Future research should explore more deeply how market orientation works to create the complementarity we observed in our research. We argue that market orientation works through several coordinating mechanisms. Future research could verify that these are at work.

Research could also investigate the resource, structural, and cultural characteristics of balanced organizations. Quinn (1988, p. 78), for example, refers to "paradoxical" firms, which appear to balance such contradictory values as efficiency and creativity. Abell (1999) suggests that firms should be able to manage a "dual strategy" by delineating clear leadership responsibilities for each strategy, iterative planning processes (between short- and long-term planning), and control mechanisms to monitor performance as well as progress towards strategic goals.

Future research could also examine the role of firm characteristics in more depth. It could be argued that firm resource differences might explain the effect of market orientation on the complementarity of marketing exploration and exploitation. Specifically, rich firms have the resources to build a market orientation and can also afford to exploit and explore simultaneously. Our study controlled for firm R&D resources that are integral to product development. In addition, to rule out whether firm resource differences influenced the exploitation–exploration interaction in the same way as market orientation, we reestimated our three-step hierarchical regression model using firm resources in place of market orientation. Results indicate no evidence of the three-way interaction of marketing exploitation, marketing exploration, and firm resources for either performance during year one (b=−0.10, *n.s.*) or year two (b=−0.02, *n.s.*).

It is also possible to consider how features related to the new product project might impact the level of tradeoffs or synergies. For example, the degree to which the project receives top management support may impact how well the organization achieves exploitation–exploration synergies. Our data include how innovative the product development project was for the firm. However, follow-up tests examining the three-way interaction of marketing exploitation, marketing exploration, and project type indicate no effect on performance during year one (b=0.20, *n.s.*) or year two (b=0.28, *n.s.*).

Research could also examine the extent to which our findings generalize to other countries, to other industries, and to other firm activities. Because our sample is limited to a set of Dutch firms, it would be interesting to examine whether our results extend to different cultures. Likewise, there may be industries where exploration is a more common strategy, such as high-tech industries. Thus, we

caution that our results do not necessarily extend to these industries. In these industries, not only is the mix of exploitation and exploration different, the content of these two strategies is also different. Specifically, recall that whereas we focus on *marketing* exploitation and exploration, high-tech firms are likely to focus on *technological* exploitation and exploration.

Finally, our reliance on primary data leaves room for future research to use secondary data. For example, utilizing secondary data for measuring project newness or financial performance can mitigate concerns that managers overrate the innovativeness and success of their firm's projects. The challenge, of course, is to find business-unit level secondary data.

7. Conclusion

We find that market orientation is one important firm-level factor that allows high levels of both marketing exploitation strategies (improving current knowledge and skills) and marketing exploration strategies (developing new knowledge and skills) to be used profitably by firms. We suggested that market orientation has this effect by offering a unifying frame of reference focused on customer goals, by facilitating organization-wide processes that create market information flows between the two strategies, and by serving as a dynamic market linking capability that integrates the two strategies within the firm. Our study of product development activities within the Dutch packaged food industry indicates that a firm's market orientation facilitates a complementarity of marketing exploitation and marketing exploration project-level strategies as reflected in improved new product financial performance. Firms without a strong market orientation reveal the classic tensions indicated in prior literature and experience financial losses.

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Appendix A

All variables on a seven-point Likert scale where 1 is "strongly disagree" and 7 is "strongly agree" unless otherwise noted.

Marketing exploitation strategies (new scale)

During this project, we improved our prior skills and procedures with respect to each of the following areas:

- Targeting and segmentation
- Product positioning and differentiation
- Product distribution
- Product design
- Product quality[9]
- Pricing[9]
- Promotion[9]

Marketing exploration strategies (new scale)

During this project, we challenged and/or changed our prior thinking with respect to each of the following areas:

- Targeting and segmentation
- Product positioning and differentiation
- Product distribution
- Product design
- Product quality[9]
- Pricing[9]
- Promotion[9]

New product financial performance during year one (Moorman, 1995)

Rate the extent to which the product has achieved the following outcomes during the first twelve months of its life in the marketplace. (7=high, 4=moderate, and 1=low)

- Market share relative to its major competitor
- Sales relative to its major competitor
- Profit margin relative to its major competitor

New product financial performance during year two (Moorman, 1995)

Rate the extent to which the product has achieved the following outcomes during the first twenty-four months of its life in the marketplace. (7=high, 4=moderate, and 1=low)

- Market share relative to its major competitor
- Sales relative to its major competitor
- Profit margin relative to its major competitor

Market orientation (Jaworski & Kohli, 1993; Kohli et al., 1993)

- In this business unit, we meet with customers at least once a year to find out what products or services they will need in the future.
- In this business unit, we do a lot of in-house market research.
- We are slow to detect changes in our customers' product preferences.[9]
- We poll end users at least once a year to assess the quality of our products and services.
- We are slow to detect fundamental shifts in our industry (e.g., competition, technology, regulation).[9]
- We periodically review the likely effects of changes in our business environments (e.g., regulation) on customer.
- We have interdepartmental meetings at least once a quarter to discuss market trends and developments.
- Marketing personnel in our business unit spend time discussing customers' future needs with other functional departments.
- When something important happens to a major customer or market, the whole business unit knows about it in a short period.
- Data on customer satisfaction are disseminated at all levels in this business unit on a regular basis.
- When one department finds out something important about competitors, it is slow to alert other departments.[9]
- It takes forever to decide how to respond to our competitor's price changes.
- For one reason or another, we tend to ignore changes in our customers' product or service needs.[9]
- We periodically review our product development efforts to ensure that they are in line with what customers want.[9]
- Several departments get together periodically to plan a response to changes taking place in our business environment.[9]
- If a major competitor were to launch an intensive campaign targeted at our customers, we would implement a response.[9]
- The activities of the different departments in this business unit are well coordinated.
- Customer complaints fall on deaf ears in this business unit.
- Even if we come up with a great marketing plan, we probably would not be able to implement it in a timely fashion.
- When we find out that customers are unhappy with the quality of our service, we take corrective action immediately.

Firm resources (New item)

In comparison with the competition: (7=high, 4=moderate, and 1=low)

- Our R&D resources

Firm innovativeness strategy (New item)

- Our firm is first in new market areas.

Project type (Hultink, 1997)

Indicate the category into which the product best fits:

- Completely new product, new market
- New product line
- Addition to existing line
- Improvement of existing product
- Repositioning of existing product
- Existing product produced at lower cost

Project-level memory (Moorman & Miner, 1997)

- During this project, our team relied on well-defined procedures.

[9] Items deleted during the measure purification process.

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