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It Won't Fit! For Innovative Products, Sometimes That's for the Best*

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The degree of overlap (i.e., fit) between product development organizations' resources and the product development projects pursued has powerful performance implications. Drawing on organizational learning theory and the resource-based view, this research conceptualizes and empirically tests the interrelationships between the levels of fit, innovativeness, speed to market, and financial new product performance. After reviewing the research literature relevant to resource fit and new product performance, the level of innovativeness is posited to be an important moderating and mediating factor, which is validated by analysis of data gathered from 279 product developing firms. Technological fit has a negative direct effect on both technological and market innovativeness, while the use of existing marketing resources (i.e., a high degree of marketing fit) positively impacts technological innovativeness. This suggests, consistent with findings from market orientation research, that a deep, long-held customer understanding can promote technological innovativeness. The moderating hypotheses proposed are also well supported: First, a high degree of marketing fit has a more positive impact on performance for market innovative products (e.g., products which address a new target market or use a nontraditional channel for the firm). Drawing on a deep customer understanding is more critical to performance for market innovative products. Conversely, the benefits of marketing fit are limited where market innovativeness is lacking. Interestingly, the counterpart moderating role of technological innovativeness on technological fit's performance effect is not significant; the level of technological innovativeness does not significantly impact the performance impact of technological fit. There are also significant moderating effects across dimensions. Our results show that the financial benefit of using existing marketing resources is lessened for technologically innovative products. Technological innovations necessitate drastic adaptation of marketing resources (i.e., channel and brand); firms drawing only on existing marketing resources for a technologically innovative new product will incur reduced profit. Similarly, the positive implications of using existing technological resources are limited for products which are highly market innovative. Generally, resource fit is seen to have an (oft-overlooked) dark side in product development, though several of our findings suggest that marketing resources are more flexible than are technological resources.

Introduction

With their limited available resources, managers are challenged to achieve a balance between time-to-market and quality of execution (Bayus, 1997). For immediate market returns, firms oftentimes direct their product development efforts on strategically "fit" projects to which they can transfer skills they have developed during the execution of previous projects (Smith and Andrews, 1995). For instance, managers at pharmaceutical firms are under pressure to replenish their portfolio of drugs in particular categories of expertise to ensure continuous revenues (Grewal, Chakravarty, Ding, and Liechty, 2008). Generally, the result may be a focus on "doable" projects, which may result in fewer radical innovations. This degree of overlap (i.e., fit) between a product development organization's resources and the product development projects the organization undertakes thus has powerful implications for innovation returns (e.g., Calantone, Chan, and Cui, 2006; Danneels and Kleinschmidt, 2001). This research explores the interrelationships between the level of fit, speed to market, and financial new product performance, and hypothesizes that the level of innovativeness of the project is an important mediating and moderating factor. Disentangling these relationships is of importance to both scholars and managers.

While it seems intuitive that the degree of overlap between new product projects and the firm's resources

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(i.e., resource fit) should be positively related to performance, empirical research has not always shown this. For instance, Cooper and Kleinschmidt (1987) found that project fit is not a significant predictor of project success. Song and Parry (1997b) showed no significant effect of technological fit on new product advantage. Furthermore, Harmancioglu, Droge, and Calantone (2009) showed that fit had no effect in determining speed to market.

Some of these seemingly conflicting past findings may be explained by our argument that the effect of being able to draw on available resources and skills is contingent on the levels of technological and market innovativeness. Generally, our argument is that resource fit's positive impact on performance will be lessened when firms are exploitative rather than exploratory with innovative projects *across* dimensions (i.e., a high degree of marketing resource fit for technologically innovative products and a high degree of technological fit for market innovative products). Firms are inappropriately exploitative when (for technologically innovative products) they fail to develop new marketing resources, since probing and exploring to develop new marketing resources is likely necessary to fully profit from a technologically innovative product. Similarly, it is argued that the positive implications of using existing technological resources will be limited for products that are highly market innovative (for instance, they address a new target market). In this case, failing to develop new technological resources may result in a firm not being able to well meet the technology needs of the new target segment.

On the other hand, a positive moderating performance effect is hypothesized *within* each dimension (e.g., a high degree of marketing resource fit for market innovative products). Firms are thought to benefit more from drawing on a well developed understanding of the technology or customer base when innovating along the same dimension. By examining both these dimensions of resource fit (market and technological) alongside two dimensions of innovativeness, it is possible to more deeply understand these interrelationships.

A mediating relationship is also examined in which both dimensions of fit are thought to have a dampening effect on innovativeness. The commonality in the set of hypotheses presented here is that resource fit is seen to have an (oft-overlooked) dark side in product development. While the tension between exploitation and exploration in product development has long been acknowledged (Andriopoulos and Lewis, 2009; March, 1991), "studies that examine the challenges associated with achieving a balance between exploration and exploitation are scarce" (Gupta, Smith, and Shalley, 2006, p. 704). Better understanding how multidimensional resource renewal optimizes performance for innovating firms marks a substantial contribution to the literature. The oft-ignored interplay between a firm's renewal of marketing and technological resources has substantial performance implications; this study contributes to the organizational learning and innovation literatures by theorizing (and demonstrating) that to optimize performance, firms must pursue organizational renewal in divergent areas of the organization to support innovations; for instance, technological innovations require the development of new marketing resources to optimize financial performance. Understanding this multidimensional interweaving of organizational renewal has powerful implications for organizations attempting to innovate. Advancing the understanding of the performance implications of managing (or failing to properly manage) these tensions (or "tug-of-war"; Andriopoulos and Lewis, 2009) when innovating are of interest to both scholars and managers.

The balance of this paper is organized as follows: In the next section, the theoretical underpinnings of our study are discussed, followed by presentation of our

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hypotheses. Following this, our methodology is detailed, concluding with our results and discussion.

Theoretical Background: Resource-Based View and Organizational Learning

In this study, the resource-based view (RBV) of the firm and organizational learning theory are used to model the role of resource fit and product innovativeness in predicting speed-to-market and financial performance. A good deal of new product development (NPD) research focuses on the role of resources as determinants of positive outcomes (Verona, 1999). Past studies have reported that new product success depends on: (1) *marketing* resources (e.g., sales force and personnel training, marketing intelligence, access to distribution channels); (2) *technological* resources (e.g., R&D personnel, and expertise, manufacturing technology) (see Barczak, 1995; Calantone and Di Benedetto, 1988). Here, consistent with prior research, both marketing and technological resources are viewed as being critical drivers of financial returns from new products (Harmancioglu et al., 2009; Song and Parry, 1996). The level of fit between a new product being developed and available resources is viewed as being critical to successful product development (Calantone and Di Benedetto, 1988; Cooper, 1979). Hence, marketing "fit" and technological "fit" are viewed as indicators of *resource advantages*, which lie at the heart of the RBV. Resources are tangible and intangible assets that allow firms to exercise their distinctive capabilities (Day, 1994; Prahalad and Hamel, 1990). Accordingly, resource fit is viewed to be fundamental to sustainable competitive advantage because fit is firm-specific and difficult for competitors to match (Cooper, Edgett, and Kleinschmidt, 1997; Olson, Walker, and Ruekert, 1995). Furthermore, fit can imply resource efficiency through little variation from standard practice (Mahoney and Pandian, 1992; Wernerfelt, 1984).

Our hypotheses are also informed by organizational learning theory, which focuses on the processes which generate organizational knowledge and particularly the ways organizations change their knowledge and behaviors (Schulz, 2001). To perform a task, an organization needs to learn from its environment and embed this knowledge internally. Exploration and exploitation are two processes which have garnered attention within organizational learning research. While exploration includes search, risk taking, and experimentation, exploitation is characterized by refinement and efficiency (March, 1991). Organizational learning theory has been applied to explaining novelty in new products as a function of the information or uncertainty of the innovating company with respect to both the respective market and technology involved (Danneels, 2002). Accordingly, here, two dimensions of innovativeness are considered (market and technological). Scholars have increasingly found meaningful insights by investigating multiple dimensions of innovativeness (e.g., Sethi, Iqbal, and Sethi, 2012); the two aspects of fit may lead to different performance outcomes based on each dimension of innovativeness.

It is important to note that resource fit and innovativeness are posited here to be related, but they are distinct constructs (Calantone et al., 2006; de Brentani and Ragot, 1996). Fit is the degree to which existing firm marketing and technical resources may be employed to develop the new product, and hence, is as a characteristic of the developing firm's resources (which include employees, brands, interfirm relationships, intellectual property, etc.). Product innovativeness, on the other hand, is viewed here as a characteristic of the ultimate product developed, indicative of the degree to which the product (and accompanying activities) is novel for the organization. To sum, fit concerns the firm's "basic building blocks" (i.e., resources), while innovativeness concerns the new product ultimately developed and the actions that development and launch of this product entail. It is certainly possible to produce technologically innovative products drawing on existing (i.e., well-fitting) technological resources (such as a firm that could be classified as serially entrepreneurial). It is just as possible to develop new (i.e., not well-fitting) technological resources and develop less innovative products (e.g., where new partnering or outsourcing arrangements lead to commoditized products; Stanko and Calantone, 2011).

Our conceptualizations of fit and innovativeness are based on Calantone et al. (2006). These authors, building on influential research on innovativeness' theoretical domain (i.e., Danneels and Kleinschmidt, 2001; Garcia and Calantone, 2002), suggest that consideration of the use of existing resources allows for a more precise estimation of the degree to which superior performance is attributable to a product's novelty, beyond the effect of existing firm resources.

Table 1 summarizes selected empirical studies focused on the effects of resource fit on product development outcomes. As would be expected, the levels of technological and resource fit have generally been associated with positive outcomes, with a few exceptions as previously noted. It is also clear that the role of innovativeness is not yet well understood within the network of relationships from resource fit through to new product returns, though Calantone et al.'s (2006) findings suggest a more

Table 1. Empirical Studies: Marketing and Technological Fit Impacting Performance

Authors	Fit	Context	Relationships Studied
Atuahene-Gima (1995)	Marketing fit	158 Manufacturing firms 117 Service firms	Tech fit → NPD success (+) Mkt fit → NPD success (+)
Atuahene-Gima (1996)	Marketing fit	158 Manufacturing firms 117 Service firms	Tech fit → NPD success (+) Mkt fit → NPD success (+)
Calantone et al. (2006)	Technological fit	451 Chemical and pharmaceutical firms	Tech fit → Product advantage (+) Tech fit → Product innovativeness (–)
Cooper and Kleinschmidt (1995)	Marketing fit Technological fit	103 Chemical firms	Tech fit → NPD success (+) Mkt fit → NPD success (+)
Danneels and Kleinschmidt (2001)	Marketing fit Technological fit	262 Manufacturing firms	Tech fit → NPD success (+) Mkt fit → NPD success (+)
Harmancioglu et al. (2009)	Marketing fit Technological fit	306 Chemical and pharmaceutical firms	Tech fit → NPD success (+) Mkt fit → NPD success (+) Tech fit → NPD speed (n.s.) Mkt fit → NPD speed (n.s.)
Li and Cavusgil (1999)	Marketing fit	236 Computer and telecommunications firms	Mkt fit → NPD success (+)
Song and Parry (1997a)	Marketing fit Technological fit	788 Manufacturing firms	Tech fit → Product advantage (n.s.) Mkt fit → Mkt intelligence (+) Tech fit → Mkt intelligence (+)
Song and Parry (1999)	Marketing fit Technological fit	788 Manufacturing firms	Tech fit → Product advantage (+) Mkt fit → Product advantage (+)
Souder and Song (1998)	Marketing fit Technological fit	120 Manufacturing firms	Tech fit → NPD success (+) Mkt fit → NPD success (+)

NPD, new product development; n.s., not significant.

involved relationship between resource fit and innovativeness. A key question becomes, how do well-fitting resources lead to superior performance? If these resources directly lead to positive returns, then this would suggest that in the context of new product innovation, firms may be better off focusing on available resources. However, if capabilities (i.e., innovativeness) through which firms' resources are deployed are the keys to competitive advantage, then another important question arises: How do capabilities affect the market outcomes of effective resource exploitation? These questions are of interest to marketing, strategy, and innovation researchers as well as practitioners.

Hypotheses

Resource fit in this research includes *marketing* and *technological* fit, which both play roles in product development and commercialization (Barczak, 1995). Resource fit indicates the degree to which the internal marketing and technological resources match the requirements of the new product project. Technological fit is the suitability of the project to existing manufacturing and R&D expertise, the current level of R&D expenditures, and training for R&D personnel that the firm has used for past projects. Marketing fit is the match of the current project to existing advertising, market research, and promotional resources. One goal of this research is to understand the contribution of resource fit to the achievement of the balance between time-to-market and quality of execution. Hence, resource fit is included in our model predicting innovativeness, speed-to-market, and financial new product performance. Since the positive financial benefits of speed to market have been well established (e.g., Carbonell and Rodriguez, 2006; Langerak and Hultink, 2005), its effects on financial performance are included in the model without formally hypothesizing this relationship.

Technological innovativeness is defined as the extent that a new product requires new technologies and/or sets of development, engineering, and design activities (Danneels and Kleinschmidt, 2001). *Marketing innovativeness* is the extent that market research, advertising, and promotion (i.e., marketing activities) are novel for the firm. Some tactics that would be considered innovative to the market include the use of novel pricing tactics or a change in retail channel structure.

Effects of Marketing and Technological Fit

It is clear that firms are highly incented to select NPD projects for which they possess adequate marketing and technical resources. A high level of fit (both marketing and technological) implies that the selected development

effort is contained within the firm's "focused scope of attention" (Harmancioglu et al., 2009, p. 270). Projects fitting with firms' technological and marketing resources should be developed more quickly and cost-effectively; the firm should make more predictable development progress since well fitting projects take advantage of existing expertise (Song and Parry, 1996). On the contrary, projects which do not fit well with existing marketing or technological resources will be markedly slower since it takes time to develop new processes and resources (Bstieler, 2005; Griffin, 2002). The effect on speed to market is crucial to understanding the overall impact of resource fit since a good deal of the positive performance implications of resource fit are thought to accrue through increased speed to market.

H1a: Technological fit is positively related to speed to market.

H1b: Marketing fit is positively related to speed to market.

While deeply understanding customers is vitally important to business operations, some have argued that knowledge stores which are inappropriately skewed toward current customers can lead to neglecting more progressive customers (Christensen and Bower, 1996; Leonard-Barton, 1992). Emerging sets of customers may prioritize different benefits from dissimilar technologies and as the technology improves, a previously overlooked segment may gain critical mass. For instance, while initial customers for LED lighting were severely limited to applications where energy use, durability, or color properties were of heightened interest (overlooked by many incumbent lighting manufacturers), over time, LED performance improved and costs decreased to the point where LEDs could challenge incumbent technology (Haitz, 2003).

As Danneels (2002) observes, the level of overlap (i.e., fit) between the product development projects a firm takes on and its existing resources helps shape the firm's "trajectory of renewal" (p. 1096). Renewal is akin to poorly fitting projects that force the firm to learn and develop new routines. When firms opt to exploit current resources through well fitting projects, this lack of renewal can hinder innovativeness. These routines will tend to become inflexible over time and can lead to an inability to develop technologically innovative products (Calantone et al., 2006; Leonard-Barton, 1992). The routines and knowledge base which have served to ensure efficiency in prior NPD efforts will result in lower innovativeness as firms struggle to adapt these inflexible routines and are constrained by an entrenched knowledge base (Ahuja and Lampert, 2001). A high level of marketing fit is likely to make firms prone to what Hamel and Prahalad (1994, p. 83) deemed the "tyranny of the served market," as these firms are unable to develop offerings that will be valued by an emerging customer base with different priorities. Firms oriented strongly around current customers and products develop less novel new products (Im and Workman, 2004) and have a lower level of organizational learning (Jacobs and Swink, 2011). By consistently interacting with and selling to an unchanging customer base, these firms' routines for engaging customers will become deeply entrenched and lessen the likelihood of market innovativeness (Michael and Palandjian, 2004).

H2a: Technological fit is negatively related to technological innovativeness.

H2b: Marketing fit is negatively related to market innovativeness.

Next, the innovativeness outcomes are addressed across dimensions (i.e., marketing fit's impact on technological innovativeness and technological fit's impact on market innovativeness). Firms are held back from innovating by the tendencies to favor (1) familiar solutions over unfamiliar ones, (2) solutions close to existing ones over completely novel solutions, and finally (3) mature solutions over those that are not yet fully developed (Ahuja and Lampert, 2001). The failure to renew resources will foster these innovativeness dampening tendencies, as structural inertia permeates across the organization (Hannan and Freeman, 1984). Accordingly, H3 argues that failure to renew marketing resources will dampen technological innovativeness and failure to renew technological resources will dampen market innovativeness.

First, firms using existing technology resources (i.e., a high degree of technological fit) will be less apt to pursue new markets or otherwise be innovative to the market. Continuous exploitation of the firm's existing internal technological resources may give rise to myopia, within which firms are less likely to consider drastic departures in their target marketing, promotional tactics, or pricing schemes. A lack of technological progress within the firm (for instance due to a lack of investment in new technology areas) is a known constraint to firms pursuing new market opportunities (Bond and Houston, 2003). Conversely, firms constantly developing technological resources tend to enter new markets to find outlets to apply new technological resources being developed; technological renewal also tends to result in a well-differentiated product portfolio (Malerba, 1992). Firms

that develop new technological resources by actively experimenting with new technologies will be more able to develop products that address different sets of customer needs, expanding the firm's reach (Slater and Narver, 2000).

Firms drawing on their existing marketing resources will tend to be less technologically innovative, as the lack of organization renewal (even across the dimensions from marketing fit to technological innovativeness) makes firms more likely to develop technological solutions that are mature and generally similar to those produced in the past (see Ghemawat, 1991). On the other hand, the continuous development of new marketing intelligence will result in novel technological offerings as firms innovate in response to their market learning (Hult, Hurley, and Knight, 2004). Firms that do not renew marketing resources have been shown to be more likely to focus on automation and process improvements, rather than technological innovations that improve the customer experience (Zahra and Covin, 1993).

H3a: Marketing fit is negatively related to technological innovativeness.

H3b: Technological fit is negatively related to market innovativeness.

Adequate marketing and technological resources have been shown to increase market success of new projects (e.g., Barczak, 1995). A high level of resource fit is likely to result in the establishment of product development routines that serve to make the firm's innovation organization more efficient at developing products. Cooper et al. (1997) suggest that to maximize the value of product portfolios, businesses should concentrate on projects consistent with their strategic direction.

Resources provide both the basis and the direction for the growth of the business itself (Mahoney and Pandian, 1992). Prior research has shown that projects considered successful entailed higher synergy (Cooper, 1979; Lee and O'Connor, 2003) and that the development of products that build on existing firm resources seem to engender higher success rates (Song and Parry, 1996, 1997a). The resource-based theory of diversification suggests that focused firms effectively transfer their resources and know-how to selected markets and outperform widely diversified firms, since (1) wider diversification suggests the presence of less firm-specific resources providing lower positional advantages; and (2) a resource loses value when transferred to less fit markets (Mahoney and Pandian, 1992). Research shows that related (i.e., strategically "fit") diversification results in higher returns compared to unrelated diversification because of the greater likelihood of synergy. Furthermore, resource fit entails little variation from standard practice, and hence may provide the firm with cost efficiencies as well as the ability to retain existing customers and maintain their satisfaction.

H4a: Technological fit is positively related to financial new product performance.

H4b: Marketing fit is positively related to financial new product performance.

Effects of Marketing and Technological Innovativeness

Drawing on RBV, innovative firms should enjoy high performance (Droge, Calantone, and Harmancioglu, 2008). Both market and technologically innovative products create opportunities for differentiation (Song and Parry, 1996). More innovative products provide more value to customers and thus advantage is greater. Innovativeness is a source of product advantage, which is widely identified as the most important driver of new product success (Henard and Szymanski, 2001).

H5a: Technological innovativeness is positively related to financial new product performance.

H5b: Market innovativeness is positively related to financial new product performance.

Resource Fit, Innovativeness, and Performance

Appropriate knowledge resources, personnel, and culture are key to developing and profiting from new products (Chen and Huang, 2009; Popadiuk and Choo, 2006); on the other hand, several researchers have proposed but did not find positive relationships between project fit and performance (e.g., Cooper and Kleinschmidt, 1987; Song, Montoya-Weiss, and Schmidt, 1997). This may suggest a more complicated, contingent set of relationships at play here. Only an ideal match between the characteristics of the firm's resources (i.e., fit) and the characteristics of the product ultimately developed (i.e., innovativeness) will result in optimal returns.

The logic underlying the proposed moderation effects within dimensions (H6) differs from that of the proposed moderation effects across dimensions (H7) since deep knowledge and the use of well-developed resources (either marketing or technological) are beneficial when developing innovative products along the same dimension. However, the use of deep knowledge and well developed resources when innovating across dimensions (e.g.,

using existing marketing resources for a technologically innovative product) holds firms back from necessary exploration without allowing firms a deeper understanding (and resource base) along the innovative dimension, which is viewed as being key to profitable product development. First, arguments supporting the moderation effects within dimensions are put forward.

Since problem solving and knowledge integration are crucial for technologically innovative projects (Olson et al., 1995), the positive financial impact of well-fitting technological resources is thought to be increased for highly technologically innovative projects. Efficiency in developing technologically innovative products is dramatically improved for firms possessing a deep, specific knowledge store related to the respective technology (Henderson and Cockburn, 1994). By exploiting engrained technological expertise in developing advanced solutions, the firm can reduce development costs and better attain a differentiation advantage. This is the firm-level equivalent of individuals being able to consistently generate creativity and virtuosity only after thousands of hours of focused practice (Ericsson, Prietula, and Cokely, 2007).

On the contrary, consider a technologically innovative project for a firm with poor technological resource fit. In this case, cost overruns are likely as firms are forced to seek out external expertise to address their own shortcoming (Veugelers, 1997). Regardless of whether firms choose to contract external expertise or attempt to develop new internal resources, additional costs to generate solutions, problem solve, and integrate information will reduce profitability when well-fitting technological resources are not in place.

Similarly, the relationship between marketing fit and financial performance is thought to be strengthened for projects which are highly innovative to the market. Theoretically, deep knowledge stores developed through an unchanging market focus (i.e., the use of existing marketing resources) support the integration of new knowledge since complex market interdependencies can be identified and structured knowledge integrating mechanisms are more likely in place (De Luca and Atuahene-Gima, 2007). The synergy created by a deep understanding of the respective customer segment and channel members for market innovative products will lead to superior financial performance (Deshpande, Farley, and Webster, 1993).

H6a: The positive relationship between technological fit and financial new product performance will be more positive under greater technological innovativeness.

H6b: The positive relationship between marketing fit and financial new product performance will be more positive under greater market innovativeness.

Next, two forms of inappropriate exploitation of existing firm resources are conceptualized, both of which occur across dimensions (i.e., market innovativeness' moderation of technological fit's effect on performance and technological innovativeness' moderation of marketing fit's effect on performance). Theoretically, these are extensions of what March (1995) refers to as "success traps." Exploitation often leads to quick results, and can breed future exploitation and a general failure for the organization to experiment and learn (Gupta et al., 2006). An "exploitation bent" may have short-term benefits, but leaves the firm prone to long-term organizational rigidity and susceptible to market shifts (Andriopoulos and Lewis, 2009). The notion of the success trap is applied to two specific instances:

First, highly market-innovative new products are posited to be less able to reap returns from using existing technological resources (i.e., a high degree of technological fit). This is referred to as inappropriate exploitation of existing technological resources. Firms' deeply embedded knowledge of particular technologies, components, and production techniques results in less profitable adaptations to conform to the tastes of new target customers or the needs of alternative channel members (Ghemawat, 1991). Beyond this, market innovative product launches de-emphasize the performance impact of technological resources, as performance for market innovative product launches hinges more strongly on firms' existing knowledge of the market (consistent with H6b). Technological resources are at their most productive use when applied to a technologically innovative product (Hadjimanolis, 2000); applying them to a market innovative product will be a less profitable endeavor. In short, firms falling into the trap of using existing technology resources to develop products which are innovative to market reduce the potential gains from the use of well-fitting technological resources.

The companion argument to this is that firms drawing on existing marketing resources (likely firms possessing a deep understanding of their current target customers) for technologically innovative products will likely find that they are less able to reap financial returns from using these well-fitting marketing resources, as they may be unable (or unwilling) to recognize attributes that emerging customer segments value (Shankar and Bayus, 2003). Here, this is referred to as inappropriate exploitation of marketing resources. Highly technologically innovative

products require firms to engage with new sets of customers (Danneels, 2002). Henderson (1993) shows that firms introducing new products tend to be hampered by their existing experiences—this effect is thought to be exacerbated by the use of existing marketing resources for technologically innovative products.

Radical technological innovations often require drastic organizational adaptation, or put differently, for firms to unleash the "gales of creative destruction" within their organizations (Danneels, 2002; Schumpeter, 1942). For radical technological innovations, the use of existing marketing resources results in firms being unable to profitably recognize and adapt to new customers. While the firm's set of marketing resources has likely served it well for past projects (setting the success trap), this source of rigidity limits firms' ability to profit from their technological innovations, indicating inappropriate exploitation of marketing resources. Aside from this, technologically innovative product launches de-emphasize the performance impact of the use of existing marketing resources. Performance, for technologically innovative product launches, is dictated more strongly on technological resources (consistent with H6a) and the development of new marketing resources to apply the new technology across a range of industry applications (Dutta, Narasimhan, and Rajiv, 1999).

H7a: The positive relationship between technological fit and financial new product performance will be less positive under greater market innovativeness.

H7b: The positive relationship between marketing fit and financial new product performance will be less positive under greater technological innovativeness.

Methodology

Data Collection

The data used in this research were obtained from a survey of 1213 Spanish firms from the chemical, machinery, electronic equipment, and transportation equipment sectors. Prior to data collection, four in-depth interviews were conducted with managers (1 in each industry sector), and a pretest was administered using 10 managers and academics knowledgeable regarding innovation topics. The purpose of both tasks was to improve the readability of the scales used and ensure unambiguous communication with respondents. Respondents were asked to evaluate a recent new product launched by their firm meeting two conditions. The product must have been (1) launched in the last 3 years (Lee and O'Connor, 2003); and (2) available to the market at least 12 months, making financial performance evaluation of the product possible (Langerak, Hultink, and Robben, 2004). Respondents (managers responsible for product development activities) were asked about their knowledge levels regarding the product development process, the product itself, and the launch to ensure competent responses. A total of 279 surveys were returned via web-based questionnaire, yielding a response rate of 23.0%, with a mean of 236.8 employees.

Measurement Development and Reliability

The constructs in this study were measured using multi-item scales (Table 2) adopted from previous studies. Consistent with our focus on the impact of resource fit, both dimensions of product innovativeness were assessed from the firm's perspective using three-item scales adopted from Danneels and Kleinschmidt (2001). These scales capture the extent that characteristics of the product ultimately developed (and the actions that development and launch entail) are novel for the firm. Technological and marketing fit were measured using four-item scales also adopted from Danneels and Kleinschmidt (2001). These scales are consistent with our conceptualization of fit as the degree to which existing firm technological and marketing resources are suitable to apply to the NPD project. Speed to market was assessed with two items adopted from Rindfleisch and Moorman (2001). To measure new product financial performance, a three-item scale was employed focusing on bottom line financial returns. Firm size (number of employees) was used as a control variable.

Confirmatory factor analysis (CFA) using LISREL 8.8 was conducted to establish convergent and discriminant validity. Convergent validity is indicated by strong fit indices ($\chi^2[137] = 360.52$; CFI = .96, NNFI = .96; RMSEA = .07) and consistently significant ($p < .01$) factor loadings. Composite reliability and average variance extracted (AVE) both exceed the recommended benchmarks of .60 and .50, respectively. Discriminant validity is demonstrated since AVE exceeds the squared correlation between any two constructs (Fornell and Larcker, 1981); see Table 3. To test for nonresponse bias, early and late respondents were compared (Armstrong and Overton, 1977), with no significant differences across groups.

Several tests were conducted to assess the threat of common method variance (CMV):

1. A confirmatory factor Harman one-factor test (see Malhotra, Kim, and Patil, 2006) shows decidedly infe-

Table 2. Measurement Model: Constructs, Items, Loadings, and Reliability Estimates

Construct, Items	SCR	Standardized λ
Technological fit		
Firm resources were far more than adequate to manage R&D activities.	.91	.88
Firm resources were far more than adequate to manage NPD activities.		.90
Firm resources were far more than adequate to manage engineering and design activities.		.86
Firm resources were far more than adequate to manage production and operations activities.		.70
Marketing fit		
Firm resources were far more than adequate to manage product communication activities.	.93	.87
Firm resources were far more than adequate to manage market research activities.		.84
Firm resources were far more than adequate to manage sales force activities.		.92
Firm resources were far more than adequate to manage distribution channels activities.		.85
Technological innovativeness		
The technology was new for the firm.	.88	.86
The engineering and design activities were new for the firm.		.89
The NPD activities were new for the firm.		.76
Market innovativeness		
The market where the product was sold was new for the firm.	.90	.90
The distribution channels were new for the firm.		.91
The competitors were new for the firm.		.76
Speed to market		
Launched on time	.85	.84
Time to take-off		.87
Financial new product performance		
Net income	.93	.82
Net profit margins		.97
Return on investment		.92

$\chi^2(137) = 360.52$ RMSEA = .07 (90% CI: .07 to .08) CFI = .96 NNFI = .96.
SCR, scale compose reliability.

rior fit ($\chi^2[152] = 3208.97$) compared to our measurement model. This indicates that a single factor does not account for the majority of the covariance among the constructs.

2. The common latent factor method (Podsakoff, MacKenzie, Lee, and Podsakoff, 2003) involves all items loading on both their construct of interest and a "common" factor. This also results in worsened fit ($\chi^2[105] = 582.80$) when compared to our measurement model. Since the common factor does not improve our measurement model this suggests CMV is not a consequential bias here.
3. Lindell and Whitney's (2001) marker variable technique calls for identification of an unrelated marker variable (competitive intensity is used here), partialling out the smallest correlation with predictor variables and comparing these partialled results to the original correlations. The adjusted and unadjusted correlations are not significantly different ($p > .05$), again suggesting CMV bias is not consequential.
4. Finally, the adjusted model variant of the marker variable technique (Malhotra et al., 2006) is used. Here, the correlation matrix is adjusted to account for common method-related correlation. A structural

Table 3. Correlation Matrix with AVE

	Mean	SD	1	2	3	4	5	6
1 Tech. fit	7.84	1.51	.84					
2 Mkt. fit	7.26	1.88	.41***	.87				
3 Speed to market	6.60	1.71	.36***	.35***	.85			
4 Tech. inno.	5.55	2.41	−.15**	.05	−.01	.84		
5 Mkt. inno.	4.36	2.54	−.12**	−.03	.04	.45***	.86	
6 Fin. NP perf.	6.39	1.93	.34***	.37***	.41***	−.03	.08	.91

Notes: $n = 279$. Numbers on the diagonal are the square root of the AVE. Off-diagonal elements are correlations among constructs.
Significance levels: *** $p < .01$; ** $p < .05$; * $p < .10$.
SD, standard deviation; AVE, average variance extracted.

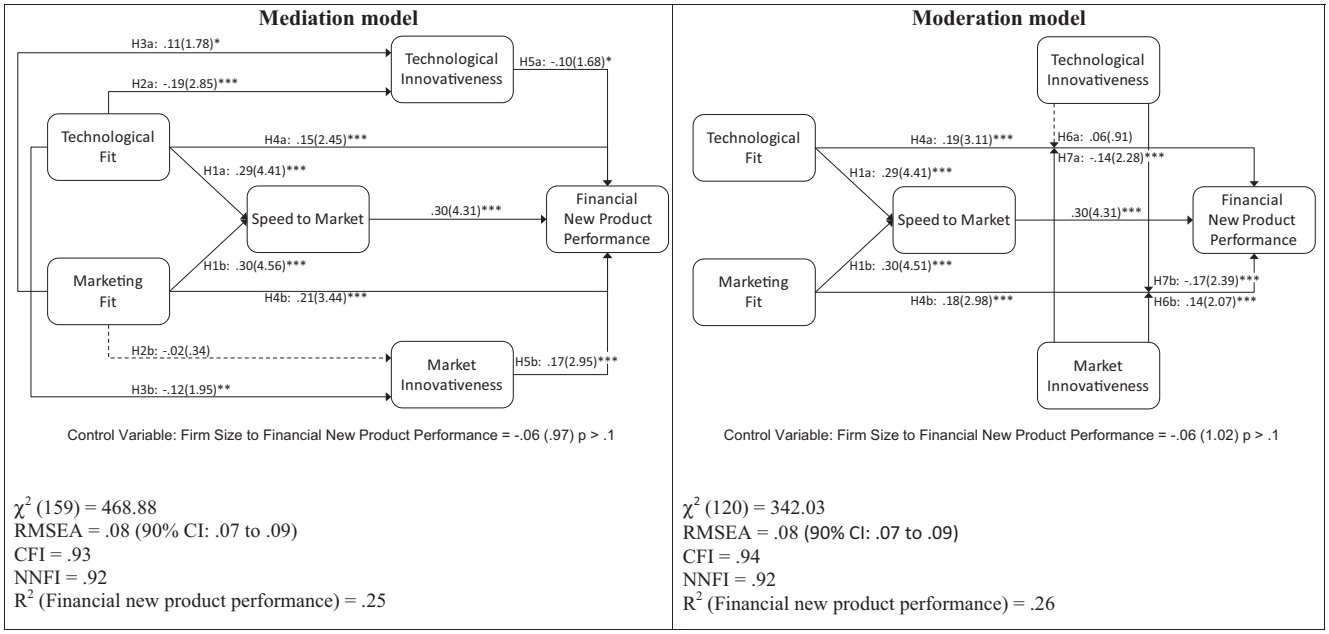

Figure 1. Structural Equation Model Results
Standardized coefficients shown (critical ratio in parentheses).
Significance levels: ***$p < .01$; **$p < .05$; *$p < .10$.
Dashed lines are nonsignificant.

model is then estimated using the adjusted correlation matrix. For both the mediated and moderated models, the results are not significantly different ($p > .05$) when compared to the structural models presented in Figure 1.

All four tests demonstrate that CMV does not threaten the interpretation of our results.

Results

Structural equation modeling was used to test our hypotheses. First, the results of our mediation model will be discussed, followed by our moderation model.[1]

Mediating Model

As shown in Figure 1, the fit indices indicate a good fit between our hypothesized model and the data ($\chi^2[159] = 468.88$; CFI = .93, NNFI = .92; RMSEA = .08). This model explains 25% of variance in the ultimate dependent variable, financial new product performance. Both dimensions of fit are positively related to speed to market (standardized coefficients = .29 [$p < .01$] for technological fit, .30 [$p < .01$] for marketing fit), supporting H1a and H1b. H2a is supported as technological fit has a negative effect on technological innovativeness (–.19, $p < .01$) though H2b is not supported by the nonsignificant path between marketing fit and market innovativeness. Technological fit also has a negative impact on market innovativeness (–.12, $p < .05$), supporting H3b. However, marketing fit has a positive effect (.11, $p < .10$) on technological innovativeness, contradicting H3a. Both technological and marketing fit have positive effects of financial new product performance (.15 and .21, respectively, both $p < .01$), supporting H4a and H4b. Technological innovativeness has a negative effect on financial new product performance (–.10, $p < .10$), contrary to H5a, while H5b is supported by the positive effect of market innovativeness on financial new product performance (.17, $p < .01$).

Next, a formal test for multiple mediation is conducted as outlined by Preacher and Hayes (2008). The likelihood

[1] Here, mediating and moderating models are sequentially examined, following De Luca and Atuahene-Gima (2007) and Quittner (1992). Though there has been discussion surrounding the veracity of simultaneous estimation of mediating and moderating effects from the same variable (Kenny, 2008; Kraemer, Wilson, Fairburn, and Agras, 2002), estimating such a model here results in results consistent with Figure 1. The only substantive change in the combined model is that the coefficient for the path from tech. inno. to fin. NP perf. is smaller (absolutely), standardized coefficient = –.04; $p > .10$. The combined model has slightly improved fit measures and predictive ability ($\chi^2[231] = 637.64$; RMSEA = .08 [90% CI: .07–.08]; CFI = .94; NNFI = .94; R^2 [fin. NP perf.] = .31) when compared to either the mediating or moderating model. Note that since the interaction terms and one of the constituent variables in each interaction term (innovativeness) is endogenous, the correlation is specified between the interaction term (fit × innovativeness) and the structural disturbance for innovativeness (PSI_z) as outlined by Ping (2009).

ratio test confirms that each of speed, technological innovativeness, and market innovativeness partially mediate the relationship between the two aspects of resource fit and financial new product performance. Standardized indirect and total effects on financial new product performance (all significant at $p < .01$) are .09 and .24 for technological fit and .07 and .27 for marketing fit.

Moderating Model

The interaction effects are modeled using Ping's (1995) approach. The fit indices indicate a good fit between our hypothesized model and the data ($\chi^2[120] = 342.03$; CFI = .94, NNFI = .92; RMSEA = .08). The moderated model explains 26% of the variance in the ultimate dependent variable, financial new product performance. With respect to the hypothesized moderation effects, technological innovativeness does not moderate the relationship between technological fit and financial new product performance (failing to support H6a), but market innovativeness moderates the relationship between marketing fit and performance (supporting H6b; .14, $p < .01$). Finally, market innovativeness moderates the relationship between technological fit and performance (supporting H7a; −.14, $p < .01$), and technological innovativeness moderates the relationship between marketing fit and performance (supporting H7b; −.17, $p < .01$).

Discussion

This study shows innovativeness plays a major role as both a moderating and mediating factor within the relationship between resource fit and performance. First, the implications of the moderation relationships are discussed, followed by specific direct effects.

Moderating Effects of Innovativeness

First, high levels of market innovativeness strengthen the relationship between marketing fit and performance. The combination of market innovativeness with the presence of appropriate marketing resources has promising implications for profit, and hence, entails an appropriate exploitation of firm resources. Conversely, lower market innovativeness attenuates the relationship between marketing fit and performance. While this finding is consistent with previous findings that marketing fit is important to performance (e.g., Song and Parry, 1999), this study refines our understanding by showing that the benefits of marketing fit are limited where market innovativeness is lacking.

Conversely, marketing fit has a less positive relationship with performance for highly technologically innovative products. Drawing on existing marketing resources for technologically innovative products is inappropriate exploitation of the firm's existing marketing resources. When technologically novel products have been developed, to ensure optimal performance, firms must seek to build new marketing resources. A multigenerational example helps illustrate this: Apple's early generations of iPod's were certainly technologically innovative products (though not pioneering; see Levy, 2006). Importantly, Apple's investment to develop relationships with publishers and build the competency to attract and lock-in recurring revenue directly from users (i.e., the development of marketing resources) enabled the launch of the iTunes Store, which enhanced profit (Gasser et al., 2004).

Our counterpart finding to this is that for highly market innovative products, firms are less able to profit from well-aligned technological resources. When firms target new markets (i.e., market innovativeness), without expanding their technological resource set, this is viewed as inappropriate exploitation of the firm's existing technological resources. In order to maximize returns for market innovative products, firms need to embrace alternative technologies that better address the needs of new customer bases, and not succumb to the success trap of exploiting existing technology resources. For instance, recently, many firms (such as BMW and Pandora.com) have been targeting smaller niches (a form of market innovativeness); when newly developed technological resources are developed (i.e., those necessary for mass customization), these market innovative projects allow newly developed technological resources to more strongly enhance profitable outcomes (Salvador, de Holan, and Piller, 2009).

The hypothesized moderating effect of technological innovativeness on the relationship between technological fit and financial new product performance (H6a) was found to be nonsignificant (in contrast to the three significant moderation effects found in this study). For technologically innovative products, there is no differential performance effect of using well-fitting technological resources. This result implies that the assuredness that comes from relying on existing technological resources remains intact regardless of the new product's level of technological innovativeness. Potential differences between this relationship and the significant moderated relationships in this study are explored further as potential future research directions.

Fit's Direct Effects on Speed to Market and Innovativeness

Our results show strong, positive direct effects of resource fit on financial new product performance, consistent with the bulk of prior research (Table 1). Our results also show both dimensions of fit to have strong, positive effects on speed to market. This conflicts with the findings of Harmancioglu et al. (2009) who found no significant effect, and adds to previous work supporting this relationship (e.g., Griffin, 2002; Song and Parry, 1996). However, overall, our findings also suggest a potential downside to well-fitting projects.

Technological fit has a strong negative effect on technological innovativeness. Firms falling into the trap of selecting easily "doable" projects are less innovative (Ahuja and Lampert, 2001). Selecting projects that fit poorly with existing technological resources results in firms developing more technologically innovative products. Curiously, the same relationship is not found between marketing fit and market innovativeness, meaning that it is plausible for firms to use existing marketing resources to develop market-innovative offerings. When viewed in connection with previous research, it appears that marketing resources are flexible in two ways that technological resources may not be. First, brand and channel (i.e., marketing) resources remain effective despite competitors' technological innovations (Lam, Ahearne, Hu, and Schillewaert, 2010). Second, using well-fitting marketing resources does not significantly impact the firm's ability to be market innovative, but contributes to new product profitability. Part of the value of developing marketing resources has long been thought to be the adaptability and flexibility that resources such as customer relationships, channel presence, and established brands afford the firm (e.g., McKenna, 1991). While firms' stocks of resources are key determinants of performance—all resources are not equal. The potential flexibility advantages of marketing resources found here will be explored further as a future research direction.

Beyond the direct effects of resource fit within dimensions, there are also significant direct effects across dimensions (i.e., technological fit has a significant impact on market innovativeness and marketing fit has a significant impact on technological innovativeness). First, technological fit has a negative impact on market innovativeness. The constant use of existing technological resources makes firms less likely to pursue new segments, or take novel channel approaches. On the other hand, firms developing new technological resources are more likely to be market innovative, as applications for newfound scientific and technological knowledge (i.e., resources) lead to engaging new sets of customers in novel ways (Christensen and Bower, 1996).

The companion finding to this, somewhat surprisingly, is that marketing fit has a positive effect on technological innovativeness. This is consistent with our earlier view of marketing resources as being inherently more flexible (vis-à-vis technological resources). Strong brands and channel relationships (i.e., resources) can lead firms toward technological diversification (Chatterjee and Wernerfelt, 1991). Other researchers have found that having a well-developed market orientation has positive innovation implications (Atuahene-Gima, 1995; Hult et al., 2004); our finding suggests that the use of long-established market knowledge and a deep customer understanding supports technological innovativeness.

Past organizational learning researchers have argued that pursuing *both* exploration and exploitation is imperative for innovative performance (e.g., Benner and Tushman, 2002; March, 1991); here this logic is extended to show that both pursuits are multidimensional and that balancing across both dimensions of resource fit is highly advisable.

Performance Effects of Innovativeness

With respect to innovativeness' direct impact on financial performance, our analysis reveals a positive effect of market innovativeness on performance; however, there is also a negative effect of technological innovativeness. This relatively small, negative effect should not come as a complete surprise, given that though generally past researchers have found positive links between innovativeness and performance, findings of negative and nonsignificant relationships have also been observed (Rubera and Kirca, 2012; Szymanski, Kroff, and Troy, 2007). Technological innovativeness involves significant expense and risk.

To sum, both the direct and moderating effects shown in this study indicate that resource fit has a dark side in product development, particularly for technological resource fit and where more innovative products (across dimensions from the level of resource fit) are sought. When this study's results are viewed together, it is clear that innovativeness plays a key role in this set of interrelationships. Well-fitting resources may increase product development returns if matched appropriately with levels of product innovativeness.

Managerial Implications

When technological innovativeness is sought after, managers should look to expand technological resources by encouraging behaviors such as investing in educating R&D personnel regarding emerging technologies, recruiting external talent with diverse technical exposure, and partnering with and learning from leading engineering and design firms in areas in which the firm lacks technological savvy. Our findings also suggest that this sort of technological renewal will foster market innovativeness; new technological skills and resources will tend to produce solutions of value to new customers and channels.

With regard to the performance implications of innovativeness, performance will be limited where technologically innovative projects call on existing marketing resources, or in the case where a project high in market innovativeness relies on existing technological resources. Our findings show that for highly technologically innovative products, firms need to invest in new marketing resources to maximize financial performance. Similarly, for highly innovative to the market products, firms need to invest in new technological resources. When firms (shortsightedly) attempt to innovate on one of these dimensions drawing only on existing resources across dimensions, financial success will be limited.

Limitations

While our study represents a step forward in understanding complexities in the relationships between resource fit, innovativeness, and performance, it is not without limitations. First, further insight may be possible using a longitudinal approach. For instance, relationships with speed to market may be compounded as firms bring generations of products to market. Being slow with one generation's product may push back multiple generations, eroding margins for each generation and slowing product diffusion. Furthermore, inappropriate exploitation may become deeply ingrained over time (Ahuja and Lampert, 2001); it may be possible to investigate this through longitudinal secondary data. Second, though outcomes of interest to both scholars and managers (speed to market, innovativeness, and financial performance) are considered here, other performance dimensions may be of interest to researchers in the future. For instance, product quality considerations are thought to be important to the decision to use existing firm resources (Bayus, 1997; Verona, 1999).

Future Research Directions

Our results bring focus to several promising questions for future research. First, the nonsignificant direct effect of marketing fit on market innovativeness indicates that marketing resources may be more flexible or "ambidextrous" (Achrol, 1991) than are technological resources (which here demonstrate a negative relationship with technological innovativeness). This requires further conceptualization and investigation. How can technological resources be rendered more flexible? One possibility is investment in information technology (see Durmusoglu, Calantone, and Sambamurthy, 2006), but there are other possibilities. Are other organizational resources, such as a design focus (see Noble, 2011), equally pliable?

Next, the significant relationships found between marketing fit and technological innovativeness and between technological fit and market innovativeness require further investigation. Marketing fit is shown here to foster technological innovativeness, while technological fit harms market innovativeness. While reasoning behind the former finding is supported by research related to market orientation's positive innovation effect (e.g., Atuahene-Gima, 1995; Hult et al., 2004), a current "technology orientation" has a dampening effect on market innovativeness. Firms using existing technology resources are less able (or less willing) to address new markets. There may be other explanations for these directionally opposed effects beyond our arguments that marketing resources are inherently more flexible.

Finally, the nonsignificant moderating effect of technological innovativeness on technological fit's relationship with performance stands in stark contrast with the other three highly significant moderating effects. What is theoretically distinct about this relationship?

While unresolved questions for future researchers certainly exist, this research has taken a needed step in deepening scholars' and managers' understanding of the complexity within the relationships of resource fit, innovativeness and, ultimately, performance.

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