

# First Product Performance: A Mediated Moderating Model of Entrepreneurial Resources and Product Positioning Strategy

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**ABSTRACT**

This article develops a mediated-moderating resource-based model to examine first-product success in Chinese new ventures. We test our conceptual model using a sample of 694 new ventures in five high-tech industries. Building on the resource-based view literature, we argue that marketing and technical resources can be combined to develop a strong product positioning strategy (conceptualized as the degree of product differentiation and the timing of product launch) that will create a competitive advantage and lead to superior first product performance. Moreover, we posit that the effectiveness of the impact of marketing and technical resources is contingent upon the startup and industry experience of the founding team. The empirical results indicate that the timing of product launch partially mediates the relationship between marketing resources and first product performance and product differentiation partially mediates the relationship between technical resources and first product performance. Founding team industry & startup experience has a unique direct and indirect impact on first product performance, and also plays moderating roles on the effects of marketing and technical resources. More specifically, experienced founding teams know how to better leverage and utilize available marketing resources to make the first product a commercial success. That said, founding team experience can act as a double-edged sword in that more experienced founding teams are poor at leveraging technical resources to develop a more differentiated first product, with negative consequences for first product performance.

**Key words: Innovation; product development; resource based view; China**

## INTRODUCTION

The development and launch of the first product is an important entrepreneurial event in the life of a new venture. The market introduction of the first product may move the venture closer toward growth, financial independence, and profitability (Schoonhoven, Eisenhardt, and Lyman, 1990). However, despite recent interest in the topic (Song, Song, and Di Benedetto, 2010; Song, Di Benedetto, and Song, 2011), the determinants and processes that make a first product successful are still not well understood.

The vast literature on new product development (NPD), which is almost uniformly focused on established firms, has identified several critical success factors that impact the development and commercialization of new products (for an excellent overview, see Montoya-Weiss and Calantone, 1994). These factors include company resources, product development and launch strategies, and internal and external relationships (e.g., Brown and Eisenhardt, 1995; Cooper, 1979; Montoya-Weiss and Calantone, 1994; Cooper and Kleinschmidt, 1987, 1995). There are both similarities and differences between the development of first products in new ventures and NPD activities in established firms. In terms of similarities, the successful development and commercialization of any product requires resources in research and development (R&D), engineering, manufacturing, and marketing in addition to a product strategy that positions the product in the market in a superior way vis-à-vis competing products (Montoya-Weiss and Calantone, 1994). In terms of differences, the development of a first product takes place in a very unique environment that imposes daunting challenges on the new venture team. New ventures face substantial resource constraints, are subjected to “liabilities of newness” (Stinchcombe, 1965; Schoonhoven et al., 1990), have no routines to develop new products, and lack organizational legitimacy (Song et al., 2010).

This study builds on the Song et al. (2010) analysis to provide a more comprehensive account of the performance-related antecedents of first products developed by new ventures in China. In addition to the traditional liabilities of newness, new ventures in a transitional economy like China face significant resource, management, and other challenges (Peng and Heath, 1996; Xin and Pearce, 1996). Institutional structures typical of capitalism—such as reliable supply and distribution chains, deep pools of highly qualified employees, sophisticated financial markets, and a sound and predictable legal framework—are just emerging in China and businesses of different size, age, and ownership have differing levels of access to these emerging institutional resources (Zhao and Aram, 1995). Examining the development and commercialization of first products in such a context can provide important insights for other new ventures for several reasons.

First, new ventures need to be particularly mindful of their product positioning strategy because they cannot afford to compete head-on with more established and resource-rich firms in their search for a profitable market position. New ventures should therefore target market segments with un(der)served needs and provide superior value to customers by offering a highly *differentiated* product that meets customer needs better than existing products (Feeser and Willard, 1990). Second, it is imperative that new ventures introduce their first product into the market in a *timely* manner in order to achieve a measure of success in gaining customer acceptance. This is especially important for ventures, such as those we examine in this study, that operate in dynamic high-tech industries characterized by intense levels of competition, shrinking product life cycles, and rapidly moving market windows of opportunity (Abell, 1978).

And third, new ventures must garner the required resources to develop and launch their first products. The two most important types of resources are marketing and technical knowledge

and skills. Founding team experience, as an important human resource, acts upon other resources and helps a new venture formulate and implement strategies to achieve superior first product performance. We focus in this study specifically on whether and how founding team experience can make a difference in leveraging marketing and technical resources' indirect impact on first product performance.

This study develops a mediated moderating resource-based model of first product performance building on recent developments in the resource-based view of the firm to answer the following research questions: 1) does product differentiation and timing of product launch mediate the impact of marketing and technical resources on first product performance? and 2) do more experienced founding teams better utilize marketing and technical resources to affect first product performance through a more differentiated product and/or a better timely launched first product? We use a sample of 694 new Chinese ventures in five high-tech industries to empirically test how the resources identified above affect the level of product differentiation and the timing of product launch which in turn may influence the market and financial performance of the first product.

Our study makes several contributions to the entrepreneurship and NPD literatures. First, this is one of the first studies that examine the antecedents of first-product success in an emerging market setting, a topic of considerable interest given the relatively short history of market-oriented entrepreneurial activity in China. Second, in contrast to the Song et al. (2010) study, we identify and conceptualize two mediating factors that may endow new ventures with a competitive advantage in the marketplace (product differentiation and timing of product launch). Third, we assess the moderating impact of a key factor that is particularly salient in a new venture context: founding team experience. Founding teams with different levels of startup and

industry experience will likely deploy and leverage marketing and technical resources in different ways and with different outcomes. Finally, we provide guidance for entrepreneurs on how to select and leverage key entrepreneurial resources to build a competitive advantage that leads to a commercially successful first product.

Our study indicates that timing of product launch serves as a positive partial mediator between marketing resources and first product performance. In contrast, product differentiation serves as a positive partial mediator between technical resources and first product performance. Furthermore, founding team experience positively moderates the impact of marketing resources on first product performance. That said, founding team experience can act as a double-edged sword in that more experienced teams hurt the level of product differentiation with negative consequences for first product performance. Finally, more differentiated first products and first products launched at the right time lead to superior market and financial performance.

## **THEORY AND HYPOTHESES DEVELOPMENT**

The conceptual model developed in this study is grounded in the resource-based view (RBV) of the firm (Barney, 1991). The primary goal of a business is developing and maintaining a competitive advantage by creating customer value (Barney and Arkan, 1991). According to Barney (1991), the RBV argues that valuable, rare, inimitable and non-substitutable tangible and intangible resources provide the basis for value creation that leads to superior performance. In this study, the value is derived from the first product developed and introduced by the new venture.

Literature suggests that marketing and technical resources are key resources for a new venture to develop its first product (Song et al., 2010). Several key marketing resources that contribute to new product development have been identified in the NPD literature and usually

include marketing research, salesforce, advertising/promotion and distribution resources and skills (Bharadwaj, Varadarajan and Fahy, 1993; Calantone and Di Benedetto, 1988; Cooper, 1979; Cooper and Kleinschmidt, 1987; Song and Parry, 1997a, b). Similarly, several technical resources have been identified that are critical to develop new products such as R&D, engineering, prototype development and testing, pilot and full scale manufacturing resources and skills (Calantone and Di Benedetto, 1988; Cooper, 1979; Cooper and Kleinschmidt, 1987; Song and Parry, 1996).

Finally, at inception the only resources available to a new venture are the human capital present in the founding team, represented in our model by the collective industry and entrepreneurial experience of the founding team (Colombo and Grilli, 2010). The entrepreneurship and NPD literatures have noted that founding team experience can be a significant moderating factor in developing a strong product positioning (Ozer, 2011) and in achieving strong product performance (Delmar and Shane, 2006; Colombo and Grilli, 2010).

However, the RBV theory does not explain how such resources can be deployed to create value that lead to a competitive advantage (Sirmon, Hitt, and Ireland, 2007). Critics of the RBV argue that the theory does not explicate links between resources and leveraging actions (Sirmon et al., 2007). Merely controlling resources does not guarantee the creation of value or the development of a competitive advantage (Barney and Arkan, 2001). To realize value creation, firms must accumulate, combine and exploit resources (Sirmon et al., 2007). Although tangible resources are necessary, in a dynamic and competitive environment (Bettis and Hitt, 1995), it is intangible resources such as a venture's skills, experience and knowledge that are more likely to satisfy the conditions for a resource to lead to value creation and competitive advantage (Miller and Shamsie, 1996).

The process of transforming resources into value for customers and the firm, and thereby creating a competitive advantage has surprisingly not been a focal point of the RBV. Resources are the source of value creation but the venture must do something with the resources to create superior value (Srivastava et al., 2001). Recent theoretical developments in the strategy and marketing literature have emphasized the importance of the value creation aspect of resources (Lusch et al, 2007; Sirmon and Hitt, 2009). The key to creating a competitive advantage is the creation of superior value for the customers, which in turn stems from the venture's understanding of the dynamics and competition in the chosen market and the unique needs of customers in that market (Srivastava et al, 2001).

Literature has conceptualized competitive advantage in two dimensions – product differentiation and cost leadership (e.g. Day and Wensley, 1988). New ventures must ensure that their first product is sufficiently differentiated and superior from competing products in terms of delivering customer benefits and in offering unique product attributes. We argue that cost leadership strategies are not appropriate for new ventures. Cost leadership requires substantial economies of scale and/or experience curve effects, two benefits that are unlikely to be realized by new ventures due to severe resource constraints (Sandberg, 1986; Covin and Covin, 1990; Carter, Stearns, Reynolds and Miller, 1994). Further, literature suggests that timing of product market entry is another key dimension of competitive advantage (Dowling and McGee, 1994; Shepherd, 1999; Shepherd, Douglas and Shanley, 2000; Shepherd, Ettenson, and Crouch, 2000). The notion that an “optimal” time of product launch exists, and that there are significant risks in launching too early or too late is related to the concept of strategic window, or the optimal time at which to seize a market opportunity (Abell, 1978). The NPD and strategy literature have long established the importance of launching a new product at the right time to maximize product

profitability and sales (Lambert and Slater, 1999), especially so in fast changing markets where windows of opportunity are shrinking fast (Cohen, Eliashberg, and Ho, 1996). Launching the product at the right time is particular important for resource-constrained new ventures that do not have the resource slack in case the capturing of the strategic window is missed the first time (Certo, Covin, Daily and Dalton, 2001).

Following above arguments, this article proposes and tests a mediated moderating resource-based conceptual model. Resources are conceptualized along two dimensions- market resources and technical resources. Marketing resources are defined as skills and resources in marketing research, salesforce, advertising/promotion, and distribution; technical resources are defined as skills and resources in R&D, engineering and manufacturing. Product differentiation and timing of the product launch mediate the relationship between resources and first product performance. Product differentiation is defined as the extent to which the product offer some unique attributes and features, is superior relative to competing products in meeting customer needs and has a superior benefit to cost advantage. We define timing of product launch as the degree to which the product was launched at the right time from the venture, distributor and customer perspective and relative to the direct competition.

Founding team industry and startup experience (as a special type of resource in new venture context) as an operant resource moderates the effects of marketing and technical resources. It is important to note that this study identifies two significant mediators (i.e. product differentiation and timing of product launch), but it does not intend to identify and include all possible mediators. Direct effects are included to control for the mediators that are the interest of this study and therefore are not included in our model. Figure 1 presents our theoretical framework and hypotheses which we develop in the following sections

<<Insert Fig 1>>

## **Marketing Resources**

Marketing resources encompass assets and competencies in the areas of advertising/promotion, salesforce, marketing research and distribution. Prior research found that marketing resources have a positive effect on product performance, primarily because distribution and advertising/promotion capabilities boost both the availability and market awareness of the product which results in greater trial and repeat purchases, and ultimately sales and market share (Song et al, 2010). However, new ventures have to have a product position strategy that helps them achieve superior product performance. New ventures have to leverage their marketing resources to create a differentiated product and launch it at the right time when the key constituents are ready to receive the product.

Product differentiation is achieved if the product has some unique attributes, provides a superior benefit to cost ratio, and is superior in meeting customer needs relative to existing products (Song et al., 2010). According to the extended RBV logic underlying our conceptual model, new ventures with strong salesforce and marketing research resources can effectively identify customer needs and perform a benchmarking analysis of competing products so that the technical staff can incorporate product unique features and attributes that can meet customer needs in a superior way (Cooper, 1979; Calantone and Di Benedetto, 1988). Highly differentiated products that offer many advantages to customers over existing products provide better potential for customer satisfaction and loyalty, and product differentiation serves as a key positive predictor for new product performance (Cooper and Kleinschmidt, 1994).

Marketing resources may also help introduce the first product in the market at the right time (Di Benedetto, 1999; Guiltinan, 1999). By deploying more salesforce and market research

skills & resources, new ventures can collect timely information on customers and competitors that generate a better understanding of when the early majority of customers are ready to adopt the product and how the competition might react to the product launch (Carson, 1985; Lambert and Slater, 1999). Furthermore, new ventures with more advertising and promotion resources can develop a strong advertising and promotions plan targeted at early majority customers and distributors to educate them about the product, its features, and its comparative advantages versus existing products to support a timely product introduction (Abell, 1978; Lambert and Slater, 1999; Lee and O'Connor, 2003). Lambert and Slater (1999) pointed to the existence of discrete market windows of opportunity to launch new products. Market windows of opportunity have been shrinking in many industries as a result of technological change, fierce competition and shifting consumer preferences (Cohen et al, 1996). Therefore, the timing of product introduction (i.e. when the window of opportunity opens up) is critical for strong product success (e.g. Huff and Robinson, 1994). Therefore we hypothesize:

*Hypothesis 1a: Product differentiation mediates the relationship between marketing resources and first product performance, in which an increase in marketing resources leads to an increase in product differentiation which, in turn, leads to increased product performance.*

*Hypothesis 2a: Timing of product launch mediates the relationship between marketing resources and first product performance, in which an increase in marketing resources leads to an increase in timing of product launch which, in turn, leads to increased product performance.*

## **Technical Resources**

Technical resources range from R&D, engineering, and prototyping skills & resources to pilot testing and full-scale production assets (e.g., Calantone and Di Benedetto, 1988; Song and Parry, 1997a, b). Greater technical resources have a direct positive impact on new product performance, primarily because stronger manufacturing resources allow the venture to develop

and manufacture the product to meet demand in the market, thereby boosting sales and market share (Calantone et al, 1996). However, technical resources have also an indirect impact on product performance. Stronger technical resources enhance the proficiency of technical activities undertaken by the venture to develop a first product (Cooper, 1979). This increase in technical proficiency should improve the relative product advantage by raising the actual performance of the new product relative to competing products (Calantone, Schmidt, and Song 1996; Song and Parry 1997).

High levels of product differentiation can be achieved by employing strong R&D and resources to create products that offer superior technical performance with unique features and attributes that meet customer needs better than competing products (Garvin, 1987). Numerous studies found a positive relationship between product differentiation (as expressed in terms of higher quality) and new product performance (e.g. Song and Parry, 1997a, b; Song et al, 2010).

Greater technical resources may also help a new venture introduce its first product at the right time i.e. at the start of the market window of opportunity. In general, greater R&D and engineering resources improve the odds for timely completion of the first product (Cooper and Kleinschmidt, 1994). Similarly, having greater manufacturing resources such as pilot and full-scale manufacturing facilities increases the likelihood that a new venture will have sufficient inventory levels to meet projected customer demand and that post-launch the distribution channel can be loaded with sufficient inventory to meet demand (Bowersox, Stank, and Daugherty, 1999). The timing of product launch is a critical determinant in the performance of the new product (Di Benedetto, 1999; Guiltinan, 1999). Song et al (2011) found that product launch quality, of which on-time introduction of the new product was one dimension, is positively related to (first) product performance. Hence we expect that:

*Hypothesis 1b: Product differentiation mediates the relationship between technical resources and first product performance, in which an increase in technical resources leads to an increase in product differentiation which, in turn, leads to increased product performance.*

*Hypothesis 2b: Timing of product launch mediates the relationship between technical resources and first product performance, in which an increase in technical resources leads to an increase in timing of product launch which, in turn, leads to increased product performance.*

### **Moderating Role of Founding Team Experience on the Effects of Marketing Resources**

Relative to teams with little or no industry experience, founding teams with strong industry experience have prior knowledge of customer problems and can better channel, leverage and focus marketing resources (e.g. advertising/promotion and salesforce) towards activities that will enhance product differentiation. This prior knowledge will ensure that the product is positioned as a highly differentiated product that provides significant advantages for the customer through unique and innovative features and attributes (Shane, 2000). In addition, an intimate knowledge of the industry, allows the founding team to more effectively leverage its market research resources to benchmark competing products and to relay that information to the technical staff so that they can develop a first product that is significantly differentiated from competing products (Li and Calantone, 1998; Shane, 2000).

Founding teams with strong entrepreneurial experience tend to generate more creative solutions to customer problems (Ucbarasan, Westhead, Wright and Binks, 2003). Recent research has indicated that prior business ownership is positively related to the uniqueness of product solutions to customer problems (Ucbarasan, Westhead, and Wright, 2009). As argued earlier, products that provide a significant relative advantage over competing products are more commercially successful than products that are marginally different from existing products (Henard and Syzemanski, 2001).

Founding teams with prior industry experience are likely intimately familiar with industry and competitor dynamics and from experience know how and approximately when windows of opportunity will emerge (Oster, 1999) relative to teams with little or no industry experience. This tacit knowledge of how the industry functions will help the founding team in better leveraging marketing resources to coordinate and time the launch of a new product with the different parties in the supply chain and customer demand (Kor, 2003) relative to teams without industry experience. Prior research has indicated that founding teams with prior entrepreneurial experience serve as a valuable source of learning on how to organize tasks during the founding process which is often chaotic, complex and compressed in time (Aldrich, 1999; Politis, 2008). In a large Chinese sample of entrepreneurs, Li, Schulze and Li (2009) found that teams with prior entrepreneurial experience had enhanced organizational capabilities and business network capabilities. These studies support our contention that founding teams with prior entrepreneurial experience know how to more effectively leverage and exploit marketing resources (especially advertising/promotion, distribution and salesforce) to coordinate and synchronize activities between suppliers, distributors and customers to ensure that the product is being launched in a timely manner, relative to teams without startup experience. A timely launch (i.e. from the perspectives of the focal venture, suppliers, and distributors and relative to competitors) is critical for new product performance (Song et al, 2009). Launching a new product too early e.g. when customers perceive the product as too risky (coming from a new venture), when there is too much resistance to change behaviors toward using the product, adoption by lead users or early majority customers will be slow or not forthcoming at all (Rogers, 2005; Lee and O'Connor, 2003). In contrast, introducing a new product too late from the perspective of customers and distributors may have invited competitors to introduce more

innovative and superior products which will hamper rapid adoption of the product (Robinson and Chiang, 2002).

*Hypothesis 3a: Founding team experience positively moderates the effect of marketing resources on first product performance; and the effect is mediated by product differentiation.*

*Hypothesis 3b: Founding team experience positively moderates the effect of marketing resources on first product performance; and the effect is mediated by timing of product launch.*

Founding team industry and entrepreneurial experience may also be helpful in amplifying the positive impact of technical resources on the level of product differentiation and timing of product launch, and subsequently the performance of the new product. In other words, product differentiation and timing of product launch mediate the relationship between the moderated impact of founding team experience on technical resources and new product performance. In contrast to teams with little or no industry experience, founding teams with industry-specific experience can more effectively identify emerging customer needs or problems, assess competitors' product performance and features, and the potential for new technologies to address industry-wide customer problems (Castanias and Helfat, 2001). This places the founding team in a better position to make more effective use of the technical resources and have a more focused R&D and engineering effort to help ensure that the first product comprises features and attributes that distinguishes itself from competing products and outperforms competing products along some critical dimensions important to customers. A (first) product that provides unique features and meets customer needs in a superior way, offers a better benefit to cost ratio to customers, and is of higher quality than competing products will be related to improved product performance (Henard and Szymanski, 2001; Song et al, 2009).

As noted earlier, experiential knowledge of the industry involves familiarity with industry conditions, dynamics and competitor behavior, and may involve personal relationships with

suppliers, distributors and customers in that industry (Kor, 2003). In contrast to teams with no industry experience, founding teams with strong industry knowledge are in a position to more effectively leverage the product development, engineering and manufacturing resources in such a way that a smooth coordination of launch activities with suppliers, distributors and customers will ensure a timely introduction of the new product (Eisenhardt and Brown, 1998). A new product that is introduced in the market at the right time has a higher level of performance than a new product that was introduced too early or too late (Song et al, 2011).

*Hypothesis 4a: Founding team experience positively moderates the effect of technical resources on first product performance; and the effect is mediated by product differentiation*

*Hypothesis 4b: Founding team experience positively moderates the effect of technical resources on first product performance; and the effect is mediated by timing of product launch.*

## **DATA AND METHODS**

### **Data collection**

The sampling frame includes 2,153 legally registered new ventures in six Chinese cities: Guangzhou, Xiamen, Putian, Shanghai, Beijing, and Fuzhou. The data used in this study is part of an ongoing research program to investigate new venture survival. The data were collected by mail surveys and from different sources in different years. First, during the first year of the new ventures founding, we collected data on founding team characteristics. Second, we followed the new ventures in our sample each year for three years to track its first product development. If a venture launched its first product during a particular year, we followed up with a mail survey to collect data on the first product development, product characteristics, and product launch variables. Third, during the following year after the product launch, a follow-up survey was administered to collect first product performance data.

Our previous field research with Chinese entrepreneurs has shown that offering the incentive of an invitation to attend research conferences or workshops in the United States can greatly increase the response rate. An invitation for participants to attend a research briefing conference, which was scheduled in the United States at the conclusion of the research project, was included with the survey package. Follow-up letters and personal phone calls were also used to increase the response rate. At the end we received complete data on 694 first-product development projects from 694 new ventures (a response rate of 32%). Of these respondents, 90.49% were project leaders; 89.19% of the respondents were involved in the development of the first product from beginning to end. The final sample included 44 new ventures in the telephone and wireless communication equipment industry; 237 new ventures in the consumer electronics industry; 134 new ventures in the games and toys industry; 98 new ventures in the computer and software products industry; and 181 new ventures in the home data networking, integrated home systems, and household appliances industry.

### **Translation of the Survey Questionnaire**

A double-translation method was used to translate the survey questionnaire from English to Chinese (Sekaran, 1983). First, the survey was translated into Chinese by a translator, and then the Chinese version was translated back into English by a second translator. Finally, a third person was asked to compare the original English version with the English version that was translated back from Chinese to ensure the accuracy of the translation and consistency across translators.

### **Test for Potential Response Bias**

The extrapolation method suggested by Armstrong and Overton (1977) was used to examine possible nonresponse bias. A multivariate analysis of variance (MANOVA) was

performed to compare participating firms with nonparticipating firms on founding team size, prior startup experience, prior industry experience, prior marketing experience, and prior R&D experience. The results indicated that there were no significant differences between the participating firms and nonparticipating firms ( $p < 0.05$ ). Therefore, we concluded that response bias is not a problem in our data.

### **Control for Common Method Bias**

The data on the dependent variable, *product performance*, were collected in a follow-up survey, 1 year after we collected data on the product development and launch data. The founding team data were collected at a different time (at founding, 1-3 years before the launch of the first product). In addition, we also carried out a Harman's single-factor test (Podsakoff et al., 2003; Podsakoff and Organ, 1986). The one-factor model did not fit the data, and an exploratory analysis of the subjective multi-item constructs yielded five distinct factors (see Table 1). The final measure for each construct is the average items that are loaded to that construct.

<< Insert Table 1 about here >>

### **Study Measures**

An exploratory analysis with principle method and orthogonal rotation was used to select the survey items and ensure that they measure the correct constructs. The final items and corresponding factors loadings are shown in Table 1. All items retained are loaded to the correct construct (smallest factor loading=0.6178), and there are no cross-loadings (the largest cross-loading=0.3841). Construct measurement reliabilities, as measured by Cronbach Alphas are greater than 0.80 (see Table 2). The final measure for each construct is the average of the items loaded to the construct. The basic statistics of the construct and other study measures are presented in Table 2.

<< Insert Table 2 about here >>

*Product performance, marketing resources, technical resources, product differentiation, and timing of product launch* -- are measured by multi-item 0-10 Likert scales. The dependent variable *product performance* is measured with six scale items that assess the product's performance in terms of sales, market share, and profits relative to the venture's objectives and competitors' products. Previous studies (e.g., Song and Parry, 1997a, b) have validated these product success scales using case studies and focus group interviews; they have concluded that these subjective measures "capture the perceptions of the respondents that underlie their decision-making processes and permit comparisons across firms, on the basis of firms' individual assessments given their particular industries, time horizons, economic conditions, and goals" (Song and Parry, 1997b, p. 7).

The eight scale items for *marketing resources (MKT)* are adapted from the Project Newprod studies (Cooper, 1979; Cooper and Kleinschmidt, 1987). These items rate the extent to which the firm's skills & resources in marketing research, advertising/promotion, sales, and distribution meet the necessary level for project success. The six scale items for *technological resources (TCH)* were developed and validated by Song and Parry (1997a). These items assess the firm's skills & resources in R&D, engineering, manufacturing.

Four *product differentiation (PDF)* scale items were adapted from Cooper (1979), Maidique and Zirger (1984), and Zirger and Maidique (1990), and they were modified by Song and Parry (1997a). These scale items measure the degree to which the product is differentiated from competing products in terms of offering unique features/attributes to customers, permitting a customer to do a job that could not be done with what were available on market, being of higher quality (tighter specifications, stronger, last longer, or more reliable), and providing a

superior benefit to cost ratio. The five scale items for *timing of product launch (TIM)* were developed and validated for this study in a pre-test involving twenty-four executive MBA students. These scale items assess the extent to which the product was launched at the target time and at the right time from the perspective of distribution, major customers, and relative to the direct competing products. *Founding team experience (EXP)* is measured as the average number of years of founding team member industry and startup experience.

### DATA ANALYSES

The mediated moderating model is tested using the three-step procedure outlined by Baron and Kenny (1986). In the first step, *product performance* is regressed on *marketing resources*, *technical resources*, *founding team experience*, *two interaction terms*, and two sets of control variables (see Equation 1 in Table 3). Regression coefficients for *marketing resources*, *technical resources*, *founding team experience*, and the interaction between *marketing resources* and *founding team experience* are positive (0.327, 0.369, 0.163, 0.040 respectively) and significant ( $p < 0.01$ ). In the second equation, *product performance* is regressed on *timing of product launch and product differentiation*; regression coefficients for both dimensions are positive (0.654 and 0.260) and significant ( $p < 0.01$ ). According to Baron and Kenny (1986), these results provide support, but not direct evidence, for mediation and moderation.

In the second step, *timing of product launch* and *product differentiation* are regressed on *marketing resources*, *technical resources*, *founding team experience*, *two interaction terms*, and two sets of control variables (see Equations 3a and 3b in Table 3). *Marketing resources* significantly affect *timing of product launch* (0.535;  $p < 0.01$ ). However, *product differentiation* is positively affected by *technical resources* and *founding team experience* (0.327 and 0.071 respectively;  $p < 0.01$ ) but negatively affected by the interaction between *technical resources* and

*founding team experience* (-0.025;  $p < 0.05$ ). In addition, *product performance* is regressed on *marketing resources*, *technical resources*, *founding team experience*, two interaction terms, *timing of product launch and product differentiation*, and two sets of control variables (see Equation 4 in Table 3). *Timing of product launch* and *product differentiation* positively affect *product performance* (0.525 and 0.132 respectively;  $p < 0.01$ ). Regression coefficients for *marketing resources*, *technical resources*, *founding team experience*, and the interaction between *marketing resources* and *founding team experience* are positive (0.246, 0.195, 0.127, 0.029 respectively) and significant ( $p < 0.01$ ), but the magnitudes are smaller than those in Equation 1. According to Baron and Kenny (1986), these results indicate that timing of product launch partially mediates the relationship of *marketing resources* with first *product performance* and *product differentiation* partially mediates the relationship of *technical resources* with first *product performance*. The third step tests the mediated moderation of founding team experience (Baron and Kenny, 1986), in which the performance is regressed on *marketing resources*, *technical resources*, *founding team experience*, four interaction terms of *founding team experience with marketing resources*, *technical resources*, *timing of product launch*, *product differentiation*, and two sets of control variables (Equation 5 in Table 1). Among the four interaction terms, only two interactions between *founding team experience* and *marketing resources* and the interaction term between *founding team experience* and *product differentiation* – are significant. These results suggest that *founding team experience* moderates the relationship between *marketing resources* and first *product performance* and the relationship between *product differentiation* and first *product performance*. However no mediated moderating effect can be directly supported.

In conclusion, results from Baron and Kenny (1986) three-step procedure support: (1) *Timing of product launch* partially mediates the positive relationship between *marketing resources* and *first product performance*; (2) *product differentiation* partially mediates the relationships of *first product performance* with *technical resources and founding team experience*; (3) *founding team experience* positively moderates the direct relationships *first product performance* with *marketing resources* and *product differentiation*.

## RESULTS

Our empirical results indicate that the level of *product differentiation* partially mediates the relationship between *technical resources* and *first product performance*, offering support for H1b. In addition, the *timing of product launch* partially mediates the relationship between *marketing resources* and *first product performance*, offering support for H2a. The findings do not support H1a since the level of *product differentiation* is not a mediator of the effects of *marketing resources* and *first product performance*. Similarly, *timing of product launch* does not serve as a mediator of the relation between *technical resources* and *first product performance*, thereby failing to support H2b.

The effects of marketing and technical resources on product differentiation and timing of product launch was moderated by founding team experience. However, the indirect effects on performance were not supported by our results, failing to support the mediated moderating hypotheses H3a, H3b, H4a, and H4b.

Nonetheless, founding team experience was found to play moderating roles. Founding team experience positively moderates the direct relationships between *marketing resources* and product performance and between *product differentiation* and *product performance*. Surprisingly, it negatively moderates the relationship between *technical resources* and *product differentiation*.

## DISCUSSION AND CONCLUSION

### Results Discussion

This study developed a mediated-moderating resource-based model of first product performance and carried out the Baron and Kenney (1986) three-step procedure to empirically test the conceptual model using data collected from Chinese new ventures. Results are interesting and somewhat surprising. Consistent with the NPD literature, we found that the *timing of product launch* serves as an effective partial mediator between *marketing resources* and *first product performance*. This finding highlights the predominantly external role of marketing resources in coordinating and synchronizing the activities of different partners in the supply chain i.e. venture, distributors and customers to ensure a timely product launch. New ventures' failure to establish strong linkages with other external partners it needs to commercialize its product is one dimension of the "liabilities of newness" faced by new ventures (Stinchcombe, 1965). Our results indicate that new ventures that successfully deal with this attribute of the liabilities of newness will have a more successful commercial outcome with its first product. In a Chinese context, *guanxi*, a potential embedded marketing resource therefore may facilitate the activities needed to introduce the first product in the market and make it a commercial success. The use of *guanxi*, support high levels of personal trust and are associated with improved levels of coordination, communication and firm performance (Xin and Pearce, 1996; Luo, 2003). These empirical results are also consonant with our conceptual model in that resources are not automatically translated into product performance, but rather are partially channeled through positioning strategies adopted by the new venture.

The level of *product differentiation* partially mediates the relationship between *technical resources* and *first product performance*. Another dimension of the "liabilities of newness" is the

absence of well-defined roles for employees of a new venture and lack of strong working relationships between these employees (Stinchcombe, 1965). Our results suggest that new ventures that are able to develop routines to craft highly differentiated products, and that require strong interactions between venture employees, are better positioned to have a more successful first product on the market. In addition, technical resources are deployed primarily within new venture boundaries to accomplish the development of a first product. Combining these two findings, we conclude that the *timing of product launch* requires strong *marketing resources* that are primarily deployed externally, and that the level of product differentiation requires strong technical resources that are primarily deployed internally. It is interesting to note that cross-functional integration (marketing and technical venture personnel working hand in hand) is not observed in a new venture context to develop a highly differentiated product or introduce the product in the market in a timely manner although the benefits of cross-functional integration to product development has been demonstrated in established firms (e.g. Swink and Song, 2007). This may be attributable to the fact that cross-functional integration requires higher level routines that have not been developed yet in new ventures (Stinchcombe, 1965). Another interesting (non-hypothesized) result suggests that *product differentiation* partially mediates the relationship between founding team industry and startup experience and first *product performance*. A team with more industry and startup experience likely knows what is required to be successful in an industry and has an in-depth knowledge of competitors' offerings which will help in defining a more unique product that provides superior benefits and fit with customer needs than competing products. Such a product will likely outperform existing products in the market.

Despite finding no evidence of a mediating effect between the moderating impact of founding experience *on marketing/technical resources* and first *product performance*, the Baron

and Kenney mediating analysis reveals interesting insights into how founding teams' industry and startup experience play a unique role in affecting the commercial success of the first product developed by new ventures in China. More specifically, the results indicate that founding team industry and startup experience moderate the direct impact of *marketing resources* on first *product performance*. In other words, experienced founding teams know how to better leverage and utilize available marketing resources to make the first product a commercial success. These teams likely have a better idea on how to use available market research skills to identify customer needs and the strengths/weaknesses of competing products, how to deploy the salesforce to more effectively sell the product to customers, how to select a target audience, advertising copy and an appropriate communication medium to drive up sales of the first product, and how to turn distributors into champions of the product to boost sales.

However, founding team experience can act as a double-edged sword, if it is not leveraged properly. More specifically, the results suggest that founding teams with more industry & startup experience are poor at leveraging the venture's *technical resources* to develop a highly differentiated first product. The impact of a more experienced team actually diminishes the effectiveness of technical resources on the level of *product differentiation*, which could subsequently negatively affect the performance of the product. One potential explanation is that new ventures might be led by teams of entrepreneurs who despite having significant industry and startup experience might not have the appropriate level of R&D experience to effectively leverage the technical resources to develop a highly differentiated product and might even misuse the available resources in its effort to develop a differentiated first product. Looking at the size of the parameter estimates of product differentiation and timing of product launch on

first product performance, one can conclude that a highly differentiated first product is more important for success than launching the first product at the right time.

Additional findings in our analysis suggest that founding team industry experience positively moderates the direct relationship between *product differentiation* and first *product performance*. This further supports our contention that overall, more founding team experience is likely still better for first product success than less founding team experience which would be consistent with prior research (Song et al., 2011).

### **Theoretical and Managerial Implications**

Until now, very few studies in the entrepreneurship and innovation literature examined the mediated contingent impact of founding team experience of company resources on product performance via a product's positioning strategy. Our approach elucidates the conceptual mechanism through which founding teams with differing levels of experience can directly and indirectly affect product performance. Our conceptual model highlights how one important dimension of the "liabilities of newness" i.e. founding team industry and start-up experience can moderate the resource-product positioning strategy relationship and subsequently affect first product performance.

The results reported in this study have also several implications for practicing entrepreneurs. Three areas are of particular relevance: composition of functional resources; the level of founding team experience, and new venture product positioning strategy.

Not surprisingly new ventures are advised to have strong functional resources (marketing and technical) and industry & startup experience. However, these functional resources are best used to achieve different objectives. New ventures with strong marketing resources are in a favorable position to ensure that the first product will be launched at the right time. In addition

strong marketing resources also have a direct positive impact on first product performance and can have an additional positive impact on first product performance when they are controlled and leveraged by a founding team with strong industry & startup experience.

New ventures that possess strong technical resources are poised to develop a highly differentiated first product and these resources can directly contribute to an improved commercial success of the first product. That being said, more experienced founding teams are not proficient in using the venture's technical resources which results in less differentiated first products. Aside from this, however, differentiated first products in the hands of a highly experienced founding team leads to additional first product performance benefits. All this suggests that experienced founding teams, if properly channeled, can have a positive impact on product performance. Ventures that adopt a product positioning strategy focused on highly differentiated products are significantly more successful than those offering marginally differentiated products or imitation products.

### **Limitations and Future Research Direction**

Our study is not without limitations. First, we did not control for key variables such as age of the venture R&D expenditures due to a lack of data availability. However, our sample only included ventures that launched their products in the first 3 years of their existence; thus, we do not expect the small variation in firm age to affect the findings of this study. Nevertheless, future research should include ventures that take more than 3 years to launch their first product and examine the impact of venture age on first-product success. Second, other resource-related variables may well be relevant in the Chinese context (e.g., government and political connections, customer service skills & resources, location-specific resources, etc.).

We find direct effects of resources on first-product success. These findings suggest the possibility that other mediators may exist. We call on future research to explore other mediators or better conceptualize product differentiation and timing. Identifying mediators is important because it enhances our understanding of how resources are converted into product success and provides guidance for managers on how best to allocate scarce resources.

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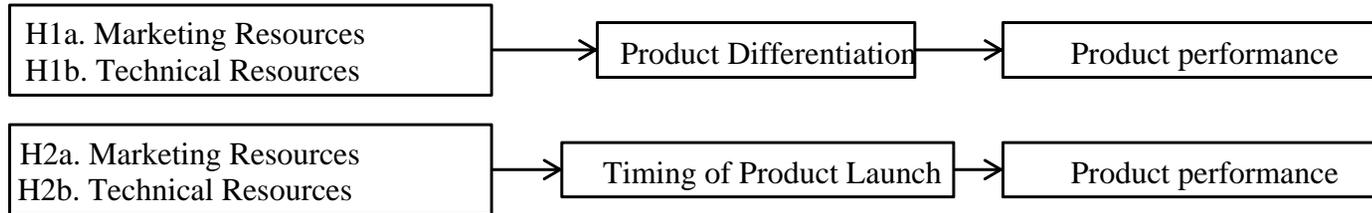
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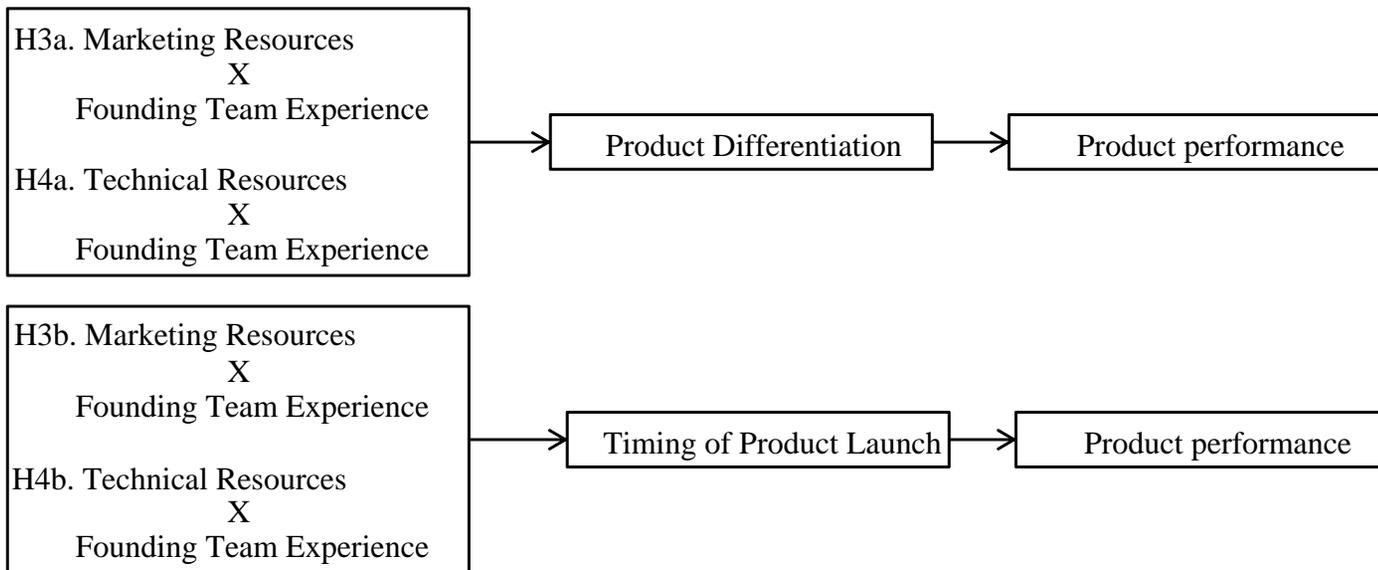
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**Figure 1. Theoretical Framework and Hypotheses**

Mediating Hypotheses H1a, H1b, H2a, and H2b:



Mediated Moderating Hypothesis H3a, H3b, H4a, and H4b



**Table 1. Exploratory Factor Analysis Factor Loading**

	<b>Product Performance</b>	<b>Marketing resources</b>	<b>Technical resources</b>	<b>Timing of Product Launch</b>	<b>Product Differentiation</b>
Perf4	<b>0.8902</b>	0.1288	0.1095	0.0752	0.1867
Perf5	<b>0.8795</b>	0.1697	0.1411	0.0843	0.2066
Perf1	<b>0.8594</b>	0.1704	0.1089	0.1205	0.1638
Perf2	<b>0.8574</b>	0.1611	0.1273	0.0760	0.1967
Perf6	<b>0.8164</b>	0.1676	0.2096	0.1142	0.2190
Perf3	<b>0.7878</b>	0.1872	0.2336	0.1479	0.2251
MKT1	0.1113	<b>0.8031</b>	0.0989	0.1075	0.0843
MKT4	0.0391	<b>0.7339</b>	0.1583	0.1065	0.0646
MKT8	0.1149	<b>0.7260</b>	0.1737	0.3643	-0.1140
MKT2	0.1898	<b>0.7118</b>	0.1710	0.3079	-0.0140
MKT7	0.1344	<b>0.7116</b>	0.0864	0.3841	-0.1601
MKT6	0.0854	<b>0.6985</b>	0.2549	-0.0633	0.1776
MKT3	0.2623	<b>0.6690</b>	0.0548	0.3199	-0.0429
MKT5	0.2269	<b>0.6514</b>	0.1870	0.0181	0.2475
TCH2	0.1227	0.2492	<b>0.8346</b>	-0.0614	0.1407
TCH6	0.0621	0.1801	<b>0.7863</b>	0.1044	0.0155
TCH4	0.1729	0.1239	<b>0.7392</b>	0.0029	0.0912
TCH5	0.0765	0.1240	<b>0.7074</b>	0.1755	0.0585
TCH3	0.1774	0.0243	<b>0.6867</b>	0.1501	0.1800
TCH1	0.2347	0.3425	<b>0.6432</b>	-0.0174	0.1313
TIM1	0.0918	0.1940	0.0136	<b>0.8202</b>	-0.0471
TIM3	0.0580	0.2053	0.0398	<b>0.7104</b>	0.0030
TIM2	0.0799	0.1648	0.1078	<b>0.7097</b>	0.0832
TIM5	0.0935	0.1122	-0.0193	<b>0.6968</b>	-0.1014
TIM4	0.0695	0.0796	0.1461	<b>0.6331</b>	-0.0703
PD1	0.2196	0.1208	0.1392	-0.1256	<b>0.6414</b>
PD6	0.4335	0.0438	0.1363	0.0509	<b>0.6378</b>
PD4	0.1574	0.0152	0.0394	-0.1004	<b>0.6193</b>
PD5	0.2608	0.0032	0.2045	0.0394	<b>0.6178</b>

Note: The numbers in bold denotes the items loaded to the corresponding construct.

**Table 2. Means, Standard Deviations, Correlation Coefficients, and Construct Reliabilities**

	<b>PERF</b>	<b>MKT</b>	<b>TCH</b>	<b>EXP</b>	<b>TIM</b>	<b>PD</b>
<b>PERF</b>	1.0000					
<b>MKT</b>	0.4008	1.0000				
<b>TCH</b>	0.3884	0.4165	1.0000			
<b>EXP</b>	0.3115	0.2489	0.1548	1.0000		
<b>TIM</b>	0.2328	0.4145	0.1857	0.0849	1.0000	
<b>PD</b>	0.5089	0.1637	0.3110	0.1627	-0.0257 <sup>ns</sup>	1.0000
<b>Mean</b>	4.1391	5.6898	6.4409	15.4798	5.9213	6.3775
<b>Std Dev</b>	2.8139	2.0712	1.8675	3.8115	2.6911	2.2148
<b>Construct Reliability</b>	0.9629	0.9139	0.8955	N/A	0.8586	0.8022

Note: <sup>ns</sup> denote the number is not significantly different from 0 at p=0.05; PERF=Product Performance; MKT=Marketing Resources; TCH=Technical Resources; EXP=Founding Team Experience; TIM=Timing of Product Launch; PD=Product Differentiation; Std Dev=Standard Deviation.

**Table 3: OLS Estimates for Baron and Kenny Mediation Test**

	Equation 1		Equation 2		Equation 3a		Equation 3b		Equation 4		Equation 5	
	Dependent Variable Performance		Dependent Variable Performance		Dependent Variable Timing		Dependent Variable Product Differentiation		Dependent Variable Performance		Dependent Variable Performance	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Intercept	4.2596 <sup>a</sup>	0.2451	4.5092	0.2361	-0.0416	0.1837	0.0215	0.1561	4.354 <sup>a</sup>	0.2182	4.3289	0.2177
Ind1	0.1638	0.4068	-0.0529	0.3915	-0.0597	0.4145	0.3848	0.3523	-0.0388	0.3620	-0.0569	0.3607
Ind2	-0.1252	0.2388	-0.1637	0.2301	0.0842	0.2430	0.0245	0.2066	-0.1467	0.2123	-0.1362	0.2117
Ind3	-0.3710	0.2765	-0.2965	0.2660	-0.0226	0.2813	-0.1789	0.2391	-0.2704	0.2459	-0.3127	0.2454
Ind4	0.1134	0.3041	0.1682	0.2928	-0.0161	0.3092	-0.1681	0.2628	0.2147	0.2705	0.2135	0.2701
1998	-0.2683	0.2913	-0.5535 <sup>b</sup>	0.2799					-0.3731	0.2594	-0.3345	0.2587
1999	-0.0439	0.2922	-0.2627	0.2814					-0.2496	0.2603	-0.2886	0.2596
2000	-0.1701	0.2663	-0.3947	0.2566					-0.3194	0.2370	-0.3084	0.2361
2001	-0.0253	0.2897	-0.2287	0.2782					-0.1078	0.2582	-0.0694	0.2575
MKT	0.3279 <sup>a</sup>	0.0500			0.5354 <sup>a</sup>	0.0508	0.0190	0.0432	0.2463 <sup>a</sup>	0.0480	0.2370 <sup>a</sup>	0.0480
TCH	0.3699 <sup>a</sup>	0.0547			0.0191	0.0556	0.3274 <sup>a</sup>	0.0472	0.1959 <sup>a</sup>	0.0504	0.2001 <sup>a</sup>	0.0502
EXP	0.1637 <sup>a</sup>	0.0252			-0.0108	0.0256	0.0716 <sup>a</sup>	0.0218	0.1279 <sup>a</sup>	0.0226	0.1340 <sup>a</sup>	0.0226
MKT X EXP	0.0404 <sup>a</sup>	0.0127			0.0177	0.0129	0.0166	0.0110	0.0299 <sup>a</sup>	0.0114	0.0254 <sup>b</sup>	0.0121
TCH X EXP	-0.0110	0.0149			-0.0104	0.0151	-0.0258 <sup>b</sup>	0.0128	0.0037	0.0133	-0.0028	0.0135
PD			0.6547 <sup>a</sup>	0.0402					0.5257 <sup>a</sup>	0.0396	0.5356 <sup>a</sup>	0.0396
TIM			0.2603 <sup>a</sup>	0.0329					0.1322 <sup>a</sup>	0.0337	0.1329 <sup>a</sup>	0.0336
PD X EXP											0.0243 <sup>a</sup>	0.0087
TIM X EXP											0.0056	0.0081
R <sup>2</sup>	0.28		0.33		0.18		0.12		0.43		0.44.	
Adj. R <sup>2</sup>	0.26		0.32		0.16		0.11		0.42		0.42	
F-Value	20.19 <sup>a</sup>		33.09 <sup>a</sup>		16.14 <sup>a</sup>		10.38 <sup>a</sup>		34.30 <sup>a</sup>		30.98 <sup>a</sup>	

Note: MKT=Marketing Resources; TCH=Technical Resources; EXP=Founding Team Experience; TIM=Timing of Product Launch; PD=Product Differentiation; S.E = Standard Error; <sup>a</sup> denotes statistical significance at p<0.01; <sup>b</sup> denotes statistical significance at p<0.05. Ind1=Telephone and Wireless Communication; Ind2=Consumer Electronics; Ind3=Games and Toys; Ind4=Computer and Software Products; Ind5=Home Data Networking, Integrated Home Systems, and Household Appliances; Ind5 was set as the base for the regression analyses.

## Appendix A: Research Variables and Study Measures

*In each of the following areas, please rate your company's skills & resources relative to the necessary level. The necessary level refers to the level which was judged by the founders to be adequate for the successful development of the selected product development project. Please circle a number from zero (0) to ten (10) which represents your best judgment. (Here: 0 = much lower than the necessary level for this project, 10 = much higher than the necessary level for this project, and numbers between 0 and 10 indicate various degrees of meeting the necessary level)*

<b>Marketing Resources</b> , new items developed from Bharadwaj, Varadarajan, Fahy (1993)	
MKT1	Salesforce resources
MKT2	Salesforce skills
MKT3	Advertising/promotion resources
MKT4	Advertising/promotion skills
MKT5	Marketing research resources
MKT6	Marketing research skills
MKT7	Distribution resources
MKT8	Distribution skills
<b>Technical Resources</b> , new items developed from Bharadwaj, Varadarajan, Fahy (1993)	
TCH1	R&D resources
TCH2	R&D skills
TCH3	Engineering resources
TCH4	Engineering skills
TCH5	Manufacturing resources
TCH6	Manufacturing skills

*To what extent does each statement listed below correctly describe this selected product? Please indicate your degree of agreement or disagreement by circling a number from zero (0) to ten (10) on the scale to the right of each statement. Here: 0 = strongly disagree, 10 = strongly agree, and numbers between 0 and 10 indicate various degrees of agreement or disagreement.*

<b>Timing of Product Introduction</b> , adapted from DeSarbo, Di Benedetto, Song, and Sinha (2005)	
TIM1	From the point of view of our major customers, the timing of our launch was excellent.
TIM2	From the distribution channel's point of view, the product was launched at the right time.
TIM3	The timing of our product launch was on target.
TIM4	Channel/trade promotion was executed on time.
TIM5	Relative to our direct competition, the timing of our launch was perfect.

<b>Product Differentiation</b>	
PD1	Compared to competitive products, this product offered some unique features or attributes to the customer
PD4	This product permitted the customer to do a job or do something he could not presently do with what was available
PD5	This product was of higher quality than competing products - tighter specifications, stronger, lasted longer, or more reliable
PD6	This product provided a superior benefit to cost ratio than competing products

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**Founding Team Experience**

EXP          Average years of experience in startup and industry

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**Product Performance**

Please indicate the success of this product on the following measures, *relative to your objectives for this product*

- PERF1      Sales
- PERF2      Market share
- PPEF3      Profits

*relative to your competitors' products*

- PERF4      Sales
  - PERF5      Market share
  - PERF6      Profits
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