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THE FIT BETWEEN PRODUCT MARKET STRATEGY AND BUSINESS MODEL: IMPLICATIONS FOR FIRM PERFORMANCE

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We examine the fit between a firm's product market strategy and its business model. We develop a formal model in order to analyze the contingent effects of product market strategy and business model choices on firm performance. We investigate a unique, manually collected dataset, and find that novelty-centered business models—coupled with product market strategies that emphasize differentiation, cost leadership, or early market entry—can enhance firm performance. Our data suggest that business model and product market strategy are complements, not substitutes.
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INTRODUCTION

A central objective of strategic management research has been to understand the contingent effects of strategy on firm performance. Contingency theory suggests that there is no optimal strategy for all organizations and posits that the most desirable choice of strategy variables alters according to certain factors, termed contingency factors (Donaldson, 1996). Accordingly, strategic management scholars have examined a wide range of contingency factors, such as aspects of the environment, organization structure (Miller, 1988), technology (Dowling and McGee, 1994), and marketing choices (Claycomb, Germain, and Droege, 2000), and explored how these and other factors interact with strategy variables to determine firm performance.

One focus of that literature considers structural forms as contingency factors. An important early contribution was made by Chandler (1962), who considered the contingency relationship between a firm's corporate strategy and its internal administrative structure (specifically, divisional versus functional form). While this particular pair of strategy/structure variables has been thoroughly addressed (e.g., see Amburgey and Dacin, 1994), the literature has otherwise paid surprisingly 'little attention to extending the question of strategy/structure fit issues for other structural forms of organization' (Yin and Zajac, 2004: 365). In this paper, we address this gap by introducing the firm's business model as a new contingency factor that captures the structure of a firm's boundary-spanning exchanges and asking: How do the firm's business model and its product market strategy interact to impact firm performance?

We address this question by elaborating on the business model, which is a relatively new, yet rich and potentially powerful concept in the strategy literature. The business model is a structural template that describes the organization of a focal firm's transactions with all of its external constituents in factor and product markets. It has been brought to the forefront of strategic

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management thinking, and has become a particularly important new contingency factor through recent rapid advances in information and communication technologies—in particular, Internet and broadband technologies—that have facilitated new types of technology-mediated interactions between economic agents (Geoffrion and Krishnan, 2003). These developments have enabled firms to change fundamentally the ways they organize and transact both within and across firm and industry boundaries (Mendelson, 2000). They have also enabled an emerging approach to enterprise-level design, as Nadler and Tushman (1997) have asserted. That approach spawns 'new designs that extend beyond the corporation's traditional outer walls,' and it helps managers 'recognize the untapped opportunities for competitive advantage that lie within their own organizations' (Nadler and Tushman, 1997: 120). Thus, the focus of organization design seems to have shifted from the administrative structure of the firm to the structural organization of its exchanges with external stakeholders. Echoing this shift, researchers have observed that the locus of value creation increasingly extends traditional firm boundaries (Dyer and Singh, 1998; Gulati, Nohria, and Zaheer, 2000; Normann, 2001), and they have therefore called for a broader conceptualization of organizational boundaries beyond the legally relevant demarcation of the firm from its environment (Santos and Eisenhardt, 2005). The business model represents this kind of broader concept.

The study of business models is an important topic for strategic management research because business models affect firms' possibilities for value creation and value capture (Amit and Zott, 2001). Since product market strategies are also chosen, or emerge, in order to increase value creation and capture by firms, researchers and managers need to know how business models and product market strategy, independently as well as jointly, impact the performance prospects of firms. In order to improve our understanding of the contingent effects of business model and product market strategy, we first examine conceptually how a firm's business model is distinct from its product market strategy. We then investigate analytically how various product market strategies and business model choices interact to affect firm performance. By examining a unique manually collected dataset on business strategy and business models, we establish empirically that a firm's product market strategy and its business model are distinct constructs that affect firm performance. Specifically, we find that novelty-centered business models, coupled either with a differentiation or cost leadership strategy, enhance firm performance measured as the market value of a firm's equity. In addition, we ascertain that a novelty-centered business model together with early entry into a market have a positive effect on performance.

This study attempts to make several contributions to the strategy literature. First, it extends the scholarly perspective of structure as an important contingency factor from a concern with the administrative structure of the firm to a focus on the pattern of transactions the focal firm enables with external stakeholders. Second, we argue theoretically, and show empirically, that the business model is a valid and distinct construct from received notions of a firm's product market strategy. This, we believe, is a particularly important point, because the business model, as a source of value, can help explain why some firms outperform others; it provides a rationale for value creation and appropriation that is distinct from (but may interact with) the firm's product market strategy. Third, we analyze the contingent effects of business model and strategy on firm performance, and we test them empirically. We show that novel business models can augment the competitive advantage realized through superior product market strategies. That is, both product market strategy and structure, as embodied by the business model, can enhance the firm's competitive advantage independently as well as jointly, and therefore complement each other.

The next sections present our theory and model, and explain the data and methods used to test the model. We then present our results, and conclude with a discussion of our findings and implications for future research.

THEORY

The contingency relationship of strategy and structure

Contingency theory seeks to understand the behavior of a firm by analyzing separately its constituent parts, making disaggregated one-to-one comparisons of variables and their links with performance (Meyer, Tsui, and Hinings, 1993). A prominent concern among contingency theorists has been to explore variables related to the strategy and

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structure of firms (e.g., Doty, Glick, and Huber, 1993; Galbraith, 1977; Miles and Snow, 1978; Mintzberg, 1979), and to examine their contingent effects on firm performance. For example, in his study of large American corporations and their approaches toward product market diversification, Alfred Chandler (1962) observed that major increases in volume, geographic dispersion, and vertical and horizontal integration of firms were followed by changes in their administrative activity, which eventually led to the emergence of the M-form of organization. That line of reasoning, however, provoked the counterargument that 'strategy follows structure' (e.g., Bower, 1970), which was predicated on the logic that managerial cognition and skills mediate between structure and strategy. The ensuing debate on the contingent relationship between strategy, structure, and firm performance flourished in the 1970s and 1980s. It has subsequently been revived through a closer empirical examination of dynamics and causality (Amburgey and Dacin, 1994) and calls for an extension of the analysis to various forms of strategy and structure that had not previously been considered (Nadler and Tushman, 1997; Yin and Zajac, 2004).

In this paper, we seek to enrich the debate on the strategy/structure fit by shifting the focus from corporate to product market strategy, and by focusing on a structural construct that captures the firm's transactions with external parties, namely, the firm's business model. We view product market strategy as the way in which a firm chooses to position itself against competitors in its addressable market spaces. We concentrate on some salient aspects of a firm's product market strategy, namely those decisions that affect the main drivers of customer demand: price, quality, and timing (Besanko, Dranove, and Shanley, 1996; Porter, 1985). A firm can leverage these drivers by making two fundamental strategic decisions: what type of product market positioning approach to adopt, i.e., cost leadership and/or product/service differentiation (Porter, 1985); and when to enter the market (Lieberman and Montgomery, 1988). The answers to these questions are central to our understanding of how firms that operate in competitive product markets create and appropriate value.[1]

The business model: a new structural concept

Technological progress has brought new opportunities for the creation of organizational arrangements (business models) among firms, partners, and customers (Geoffrion and Krishnan, 2003; Mendelson, 2000; Normann, 2001). The business model is a structural template of how a focal firm transacts with customers, partners, and vendors; that is, how it chooses to connect with factor and product markets. It refers to the overall *gestalt* of these possibly interlinked boundary-spanning transactions. Consider the case of Priceline.com Inc., a provider of an electronic pricing system known as a demand collection system (Hann and Terwiesch, 2003). Transactions are enabled through a reverse market auction mechanism for which the company has secured a business method patent, indicating that the business model is fairly innovative. Priceline allows customers to name the price at which they wish to transact, and the company attempts to find a provider of the product or service within a specified price range. Priceline's novel business model enables buyers to save money on a wide range of products and services by trading flexibility about the choice of brands, product features, timing, convenience, and/or sellers in return for prices that are lower than those charged through traditional retail channels. At the same time, Priceline enables sellers to generate incremental revenue by disposing of excess inventory or capacity at prices lower than they offer through other channels, while protecting their brand.

The business model can then be defined as 'the structure, content, and governance of transactions' between the focal firm and its exchange partners (Amit and Zott, 2001 : 511).[2] It represents a conceptualization of the pattern of transactional links between the firm and its exchange partners.[3]

[1] There are many more possible facets of a firm's product market strategy that could be explored in future research; for example, the firm's product offering, served customer segments, or geographic markets.

[2] There are other definitions of the term business model, for example, those that define it as the way a firm generates revenues (for an overview, see Ghaziani and Ventresca, 2005). For the purpose of this article, however, we rely on the definition proposed by Amit and Zott (2001), and on the distinction between business and revenue models: a revenue model refers to the specific modes in which a business model enables revenue generation.

[3] The business model construct is distinct from the value net strategic analysis framework developed by Brandenburger and Nalebuff (1996). The players in the value net, such as competitors and certain complementors, may or may not be part of the

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Business models can be characterized by their design themes, which capture the common threads that orchestrate and connect the focal firm's transactions with external parties. The design themes describe the holistic *gestalt* of a firm's business model, and they facilitate its conceptualization and measurement. They are not mutually exclusive: several design themes may be present in any given business model. In this paper we focus on novelty and efficiency as design themes (Zott and Amit, 2007), because they are the corresponding themes (on the business model level) to product differentiation and cost leadership (on the product market strategy level), and thus are the appropriate contingency factors to consider. This choice of design themes suits our theoretical purpose of exploring the fit between business model and product market strategy.

Novelty-centered business models refer to new ways of conducting economic exchanges among various participants. The conceptualization and adoption of new ways of conducting transactions can be achieved, for example, by connecting previously unconnected parties, by linking transaction participants in new ways, or by designing new transaction mechanisms (like Priceline). Efficiency-centered business models refer to the measures firms may take to achieve transaction efficiency (i.e., reduce transaction costs for all participants); they do not refer to the outcome (efficiency) itself. The essence of an efficiency-centered business model is the reduction of transaction costs (Williamson, 1975). This reduction can derive from the attenuation of uncertainty, complexity, or information asymmetry, as well as from reduced coordination costs and transaction risk. An example of an efficiency-centered design element would be the order-tracking feature in Amazon's business model, which is aimed at enhancing transaction transparency, and thus at increasing efficiency. As a whole, Amazon's business model is both efficiency- as well as novelty-centered, which illustrates the point made above that the design themes are not orthogonal.

The business model can be a source of competitive advantage that is distinct from the firm's product market position (Christensen, 2001). Firms that address the same customer need, and pursue similar product market strategies, can do so with very different business models. Consider, for example, the market for navigation software for devices such as personal digital assistants, handheld computers, or smart phones. Some firms in that space offer non-wireless solutions directly to the end-user in a one-shot transaction, while others, like the French company Webraska, offer wireless navigation solutions that can be sold through wireless carriers, and that require a very distinct set of ongoing exchanges between the firm, end users, and the wireless carriers (Zott and Bancerek, 2004). A firm with a distinct business model that creates more value than that of its rivals holds a potential advantage. All other things being equal, it has the possibility to capture more value for its shareholders. Consequently, a business model may affect a firm's performance outcomes, as does a firm's product market strategy, and therefore its contingent effects on product market strategy need to be considered. In Table 1 we contrast business model and product market strategy.

Table 1 shows that product market strategy differs from the business model mainly through its focus on the positioning of the firm *vis-à-vis* its rivals, whereas the business model is a structural construct that centers on the pattern of the firm's economic exchanges with external parties in its addressable factor and product markets. To illustrate this distinction, consider four firms (all taken from our sample, on which we elaborate in the methods section below) that have adopted different business model and product market strategy configurations: Priceline, NetBank, Didax, and Multex. Earlier we described how Priceline has chosen a product market strategy of cost leadership, and a business model centered on novelty. This choice can be contrasted with that of another firm—NetBank, an online bank—which has combined its cost leadership strategy with a more efficiency- than novelty-centered business model. In terms of cost leadership strategy, NetBank clearly aims at providing cost-effective banking services. It does not incur the cost of supporting a branch system, keeps its overhead low, and partners with outside providers of specialized services and technologies who enjoy economies of scale. Moreover, NetBank's business model is efficiency-centered. NetBank enables fast transaction processing, reduces customer search and information costs by providing rates and fees comparisons, and provides lenders with information

business model because some of them may not transact with the focal firm.

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Table 1. Business model and product market strategy

	Business model	Product market strategy
Definition	A structural template of how a focal firm transacts with customers, partners, and vendors. It captures the pattern of the firm's boundary spanning connections with factor and product markets	Pattern of managerial actions that explains how a firm achieves and maintains competitive advantage through positioning in product markets
Main questions addressed	How to connect with factor and product markets	What positioning to adopt against rivals
	Which parties to bring together to exploit a business opportunity, and how to link them to the focal firm to enable transactions (i.e., what exchange mechanisms to adopt?)	What kind of generic strategy to adopt (i.e., cost leadership and/or differentiation)?
	What information or goods to exchange among the parties, and what resources and capabilities to deploy to enable the exchanges?	When to enter the market?
	How to control the transactions between the parties, and what incentives to adopt for the parties?	What products to sell?* What customers to serve?* Which geographic markets to address?*
Unit of analysis	Focal firm and its exchange partners	Firm
Focus	Externally oriented: focus on firm's exchanges with others	Internally/externally oriented: focus on firm's activities and actions in light of competition

* Elements of product market strategy marked with an asterisk are not addressed in this paper. They could be addressed in future work.

about account registrations so that they can tailor their offerings better to customer preferences. At the time of our measurement, NetBank's business model was less novelty-centered. Although the firm had been a pioneer with its online banking business model, the model had already been copied by competitors like Wingspanbank.com, and NetBank had not managed to sustain the innovative edge of its business model. So, while Priceline and NetBank both pursue cost leadership strategies, they have emphasized different design themes for their respective business models.

Now consider Didax and Multex, firms that have coupled a product differentiation strategy with different choices of business models. Didax (later acquired by Salem Communications and operating as Crosswalk.com) was an online portal for Christians and Christian-related institutions that offered its clients products and services such as consulting and IT management. The firm aimed at product differentiation by constantly developing and marketing new services. For example, it introduced real-time forums across new topical areas, such as Christian life. At the same time, its business model was novelty-centered, because it brought together a new range of participants (individuals, businesses, churches, nonprofit organizations) who had novel incentives to participate and do business on a community portal, namely those based on Christian values and the desire to support charity.

Didax can be compared and contrasted with Multex, a firm that combined a product differentiation strategy with an efficiency-centered business model. Multex offered and distributed financial information and research via Web platforms to over 25,000 companies around the world (Reuters acquired the company in 2003). Multex clearly pursued a product differentiation approach: the firm constantly introduced new service features, such as easy-to-read report formats, and it developed proprietary technology to enhance its services (e.g., software to distribute research reports quickly to specific authorized users). Its business model, however, was that of an efficiency-centered financial information integrator and distributor. The transactions the firm offered to its clients enabled fast access to complex information. The transactions were simple, mass-customized, and enabled the firm to reach a vast pool of

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geographically dispersed clients—indicators of an efficiency-centered business model.

The conceptual distinction between the business model and the product market strategy of firms, illustrated by these examples, leads us to propose a corollary, which we state explicitly because the conceptual arguments that support the conjecture that business models and product market strategies differ are relatively new (e.g., see Magretta, 2002), may not be widely known or accepted, and until now have not been empirically established.

Corollary: Business models (as, for example, measured by design themes) are distinct from product market strategies (as, for example, measured by generic strategies).

Having established the distinction between the business model and product market strategy constructs, what is the fit between them, and what are the implications of it? Contingency theory implies that organizational effectiveness (measured, for example, in terms of firm performance) is a function of the fit between contingency factors. According to Galbraith (1977: 6) fit, or 'coherence,' 'is the primary determinant of success.' For example, it can be argued that alignment between a firm's administrative structure and its diversification strategy has positive implications on firm performance (Chandler, 1962). Recent research into the relationship between strategy and structure has confirmed a moderating effect of these constructs on firm performance (Mintzberg, 1990; Siggelkow and Levinthal, 2003). This research has highlighted the usefulness of examining interactions between salient dimensions of strategy and structure on firm performance. It has also established that alignment between these factors could be expected to result in higher performance.

The fit between product market strategy and business model

To evaluate the implications of business model and product market strategy on firm performance, we consider two main business model design themes—novelty-centered and efficiency-centered—along with three product market strategy choices: cost leadership, differentiation (Porter, 1985), and the timing of entry into a market (Lieberman and Montgomery, 1988). As with business model design themes, these product market strategy choices are not mutually exclusive, nor are they exhaustive. For example, a firm's managers could choose to pursue simultaneously a strategy of product differentiation, cost leadership, and early market entry.

Which business model fits best with the firm's choice of product market strategy? Or, to put it another way, what constitutes a good fit between these constructs? The literature generally considers coherent configurations of design elements that manifest themselves as peaks in the performance landscape as good fit (Siggelkow, 2001). Two design elements (A and B) fit well if there are complementarities between them; that is, if the marginal benefit of A increases with the level of B, and if the levels of A and B are adjusted optimally to achieve a local performance optimum (Milgrom and Roberts, 1995).

We have developed a formal model that allows us to investigate which combinations of business model design themes and product market strategies fit well. This model helps us to theorize about these relationships in a more structured and rigorous way than would be possible through verbal theorizing. It is useful because there has been little prior theorizing on business models on which we could draw in the development of our theory. Our objective, however, is not to derive a fully specified model and closed-form analytical solutions. We intend to provide theoretical guidance for our empirical analysis.

We build on the model developed by Brandenburger and Stuart (1996) for value creation in a simple static setting with one firm, one customer, and one supplier. We adapt this model to focus on the transactions that a business model enables, rather than on a particular product or service. Let $P(t)$ be the price that a customer pays for a good or service acquired in transaction t, or for the right to participate in the transaction. The focal firm has adopted a business model of type $\mathbf{d}$, where $\mathbf{d}$ is a vector describing the extent to which the business model emphasizes the design themes novelty and efficiency. It has also adopted a product market strategy $\mathbf{s}$, where $\mathbf{s}$ is a vector describing the extent to which the firm emphasizes differentiation, cost leadership, and early entry timing. For simplicity, denote that firm as $F_{\mathbf{s}}^{\mathbf{d}} \equiv F$. Denote the focal firm's suppliers and partners (other than customers) as i, where i is an index ranging from 1 to I, the total number of suppliers and partners

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in the business model. Let $R_i(t)$ be the revenues that focal firm F gets from partner i in a particular transaction t. Let $C_i(t)$ denote the flow of revenues from F to i, and let $C_F(t)$ be F's costs of providing its own resources, such as financial capital or intellectual capital (e.g., patents, trademarks). Then the value appropriated by firm F in transaction t can be expressed as:

$$V_F(t) = P(t) + \Sigma_i R_i(t) - \Sigma_i C_i(t) - C_F(t) \quad (1)$$

The total value appropriated (TVA) by firm F is the value appropriated in all types of transactions t that the business model enables, where t is an index ranging from 1 to T, and T denotes the number of transaction types, $n(t)$ is the average number of transactions of type t conducted:

$$\text{TVA} = \Sigma_t[V_F(t) \times n(t)] \quad (2)$$

Inserting Equation 1 into Equation 2 yields:

$$\text{TVA} = \Sigma_t \Big\{ \big[P(t) + \Sigma_i R_i(t) - \Sigma_i C_i(t) - C_F(t) \big] \times n(t) \Big\} \quad (3)$$

Table 2 summarizes the variables of the model. TVA as a proxy for firm F's performance is contingent on F's business model, **d**, and its product market strategy, **s**. If **d** and **s** are choice variables of the firm, their impact on each term on the right-hand side of Equation 3 must be considered in order to understand their collective impact on TVA. Following Siggelkow (2002), a useful thought experiment for evaluating the fit between a particular business model design theme and a particular product market strategy is to consider whether the marginal value of a business model design theme would be affected (in particular, whether it would increase) if a firm were to put more emphasis on the respective product market

Table 2. Summary of variables

Variable	Meaning	Affected by which business model design theme/product market strategy	Expected sign of effect on variable[a]
t	Index denoting the transaction type ($t = 1, \ldots, T$)		
T	Total number of transaction types	Business model novelty	+
$P(t)$	Price that a customer pays for a good acquired in transaction t, or for the right to participate in the transaction	Business model novelty Differentiation strategy Cost leadership strategy Early market entry timing	+ + − +
F	Focal firm		
i	Index denoting F's suppliers and partners ($i = 1, \ldots, I$)		
I	Total number of F's suppliers and partners		
$R_i(i)$	Revenues that F gets from supplier/partner i in a particular transaction t		
$C_i(t)$	Costs for focal firm F of collaborating with supplier/partner i in a particular transaction t	Business model novelty Business model efficiency Cost leadership strategy Early market entry timing	− − − −
$C_F(t)$	Focal firm's costs for providing its own resources for transaction t	Business model efficiency Cost leadership strategy	− −
$V_F(t)$	Value appropriated by firm F in transaction t		
$n(t)$	Average number of transactions of type t	Business model efficiency Cost leadership strategy Early market entry timing	+ + −
TVA	Total value appropriated by firm F		

[a] That is, expected sign of the effect of a marginal increase in emphasis on the respective business model design theme or product market strategy on the variable.

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strategy (or vice versa). This thought experiment is consistent with the definition of fit as indicative of complementarity (Milgrom and Roberts, 1995; Siggelkow, 2001). From this we go on to explore the marginal effects of business model design themes and product market strategies on TVA.

Novelty-centered business model and TVA

A novelty-centered business model refers to the conceptualization and adoption of new ways of conducting economic exchanges among transaction participants. Novelty primarily aims at creating new types of transactions, i.e., increasing T. It also strengthens the focal firm's bargaining power *vis-à-vis* other business model stakeholders. The focal firm is the innovator, and its business model is the locus of innovation. The higher the degree of business model novelty, the higher the switching costs for the focal firm's customers, suppliers, and partners, as there may not be readily available alternatives to doing business with the focal firm (Zott and Amit, 2007). Consequently, stronger emphasis on a novelty-centered business model will have a positive effect on $P(t)$ and will exert downward pressure on $C_i(t)$ due to the increased bargaining power of the focal firm. Hence, a marginal increase in a firm's emphasis on a novelty-centered business model may affect TVA in Equation 3 through $T(+)$, $P(+)$, and $C_i(-)$.[4]

Next, we examine the marginal effect on TVA of changing a particular product market strategy, and follow that with an analysis of the impact of such a change on the marginal value of a novelty-centered business model.

First, consider product market differentiation. A stronger emphasis on differentiation will influence customers' willingness to pay positively, and therefore make it easier for the focal firm to charge higher prices to customers, $P(t)$.[5] Hence, a marginal increase in a firm's emphasis on differentiation may affect TVA mainly through $P(+)$; this is how product market differentiation independently affects firm performance.

In addition, we consider the interaction between differentiation strategy and novelty-centered business model design. A focus on innovation in multiple domains (business model, product market strategy) may be mutually reinforcing, for example, by harnessing the creative energy of managers and employees, and by delivering new products and services to customers in new ways, thereby increasing the number of transaction types (T). Moreover, a firm that focuses all its activities and transactions on innovation may become an even more skillful innovator over time (Zott, 2003). At the same time, as Hargadon and Douglas (2001) have suggested, stakeholder acceptance of a product innovation hinges on whether or not the innovation is presented and brought to market in familiar ways. Business model novelty, however, does not preclude familiarity. A novelty-centered business model could rely on familiar design elements, combined in new ways that mediate between the innovative features of a differentiated product offering and the expectations, norms, and rules of the institutional environment. The development of an online Christian community in the case of Didax, for example, represented a novel approach to business model design that relied on design elements (e.g., the concept of a Christian community) with which the users were already familiar. These elements facilitated customers' acceptance of an innovative product and service offering. On balance, we could expect a positive joint effect on TVA: a marginal increase in the degree of product market differentiation will strengthen the marginal performance benefit of business model novelty (and vice versa).

Second, consider cost leadership. A stronger emphasis on cost leadership implies lower prices charged to customers, $P(t)$, as well as lower input and production costs, $C_i(t)$ and $C_F(t)$ (Porter, 1985). Furthermore, new segments with customers highly sensitive to price can be addressed, and customers within given segments will be motivated to increase their number of repeat transactions, thus raising $n(t)$.[6] In other words, a marginal increase in a firm's emphasis on cost leadership may affect

[4] The sign in parentheses gives the expected direction of change in the respective variable from a marginal increase in novelty-centered business model design: e.g., $T(+)$ means that T increases in novelty-centered design.

[5] Product market differentiation may also engender higher costs, $C_i(t)$ and $C_F(t)$, but the overall effect could still be performance-enhancing, as Porter (1985: 14) has observed: 'A firm that can achieve and sustain differentiation will be an above average performer in its industry if its price premium exceeds the extra costs incurred in being unique.' We thank a reviewer for pointing out this insight.

[6] This argument is based on one of the following two assumptions: (1) a marginally increased emphasis on cost leadership does not affect the (perceived) quality of the product and hence does not lead to a lower willingness to pay (WtP) by customers who, as a result, might abandon the firm; (2) if, however, the

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TVA through $P(-)$, $C_i(-)$, $C_F(-)$, and $n(+)$; this is how cost leadership independently affects firm performance.

Moreover, a greater emphasis on cost leadership can also, on balance, enhance the marginal effect of a novelty-centered business model on TVA. A more pronounced cost leadership approach interacts positively with the firm's strengthened bargaining power over its suppliers through an increased novelty-centered business model as it puts additional downward pressure on C_i. Again, new customers will have distinct reasons to be drawn to the firm and engage in transactions with it—business model novelty and low cost—which enhances the positive impact of a novelty-centered business model on n. Could there also be a potential substitution effect? Different stakeholders within the organization might work at cross-purposes, some trying to lower cost, others focusing on creating a novel business model. Firms like Priceline and Dell show that this need not be the case: firms can have novel business models that support and enhance the effectiveness of their cost leadership strategies. Organization members can implement low-cost strategies within a given novel business model; they do not necessarily represent conflicting objectives. Customers, too, may welcome low prices, and in return accept the new ways of doing business that help achieve these low prices (e.g., in Priceline's case, the reverse auction to sell airline tickets; and in Dell's case, phone ordering and the tailoring of computers to customers' needs). Conversely, adopting these new ways of conducting transactions is helped by lower costs, which give customers an increased incentive to adapt their behavior. Therefore, overall, we could expect a positive joint effect of cost leadership and novelty-centered business model on TVA.

Third, consider timing of market entry. Firms that enter markets earlier may enjoy considerable advantages arising from the creation of customer switching costs, brand awareness, and reputation, thus allowing these firms (at least initially) to charge higher prices $P(t)$ (Lieberman and Montgomery, 1988). Early market entrants can also gain by learning (Arrow, 1962), accumulating proprietary knowledge (Dierickx and Cool, 1989), and by preempting scarce resources, thus lowering the costs of resources, $C_i(t)$ (Lieberman and Montgomery, 1988). As the early entrant attempts to address—and perhaps even create—a new market, the number of transactions, n, is initially likely to be limited (although it could become high later on (eBay is a case in point). In other words, a marginal increase in a firm's emphasis on early market entry timing may affect TVA through P(+), $C_i(-)$, and $n(-)$; this is how the timing of market entry independently affects firm performance.[7]

A greater emphasis on early market entry can also, on balance, enhance the marginal effect of a novelty-centered business model on TVA. Moving into a market earlier allows the firm to capture the rents from business model innovation, which can be considered entrepreneurial rents, i.e., rents that accrue between the introduction of an innovation and its diffusion (Rumelt, 1987). In particular, the positive effect of a novelty-centered business model on P may be more pronounced, and more sustainable if the firm enters a market early. Although there could be a concern that early market entry coupled with a novelty-centered business model might represent a high hurdle for achieving stakeholder (in particular, customer) acceptance, novel business models can include familiar design elements. Hence, on balance we could expect a positive joint effect on TVA.

In summary, this analysis suggests that coupling a novelty-centered business model with a product market strategy of differentiation, cost leadership, or early market entry represents good fit.

Efficiency-centered business model and TVA

An efficiency-centered business model aims at reducing transaction costs for *all* transaction participants. This explains the likely negative effects of a marginal emphasis in such business model design on $C_F(t)$ and $C_i(t)$. By reducing transaction costs, an efficiency-centered business model may also lead to higher transaction volume, $n(t)$; more new customers will be drawn to transact with the focal firm, and existing customers may transact more frequently as a result of the lowered transaction costs. Hence, a marginal increase in a firm's

WtP of customers declines, with the risk that some customers might be lost that way, a lower price, $P(t)$, compensates for this loss, so that on average $n(t)$ (the number of transactions) still increases. We thank an anonymous reviewer for pointing this out.

[7] As our arguments suggest, the strength of these effects may depend on the time when they are measured—right at the early market entry, or sometime afterwards. Although our model does not contain time as a variable, it could be extended in that direction.

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emphasis on an efficiency-centered business model may affect TVA through $C_F(-)$, $C_i(-)$, and $n(+)$.[8]

To evaluate the possible fit between an efficiency-centered business model and a particular choice of business strategy, we examine whether the marginal value of an efficiency-centered business model would increase if a firm were to put more emphasis on a particular product market strategy.

First, consider the strategy of differentiation. As shown above, a marginal increase in a firm's emphasis on product market differentiation may affect TVA independently primarily through $P(+)$. It is not clear whether and how product differentiation would affect the marginal effect of an efficiency-centered business model on TVA through C_F, C, and n. Hence, the joint effect of differentiation and an efficiency-centered business model on TVA is likely to be indeterminate.

Second, consider cost leadership. We have seen that a marginal increase in a firm's emphasis on cost leadership may affect TVA independently through $P(-)$, $C_i(-)$, $C_F(-)$, and $n(+)$. A focus on low costs in multiple domains (business model, product market strategy) may be mutually reinforcing by focusing managers' efforts on cost savings across transactions, products, and processes, and by delivering low-cost products and services to customers in low-cost ways, thereby reinforcing the marginal effects of efficiency-centered design on TVA through C_F and n. Moreover, a firm that focuses on cost reductions in all its activities and transactions may become even more skillful at reducing costs over time, thus decreasing C_F even further. Hence, we might expect a positive joint effect of cost leadership and an efficiency-centered business model on TVA.

Third, consider timing of market entry. A marginal increase in a firm's emphasis on early market entry timing may affect TVA independently through $P(+)$, $C_F(-)$, and $n(-)$. However, it is not clear whether and how early market entry timing, on balance, affects the marginal benefit of an efficiency-centered business model. On the one hand, one could argue that early adopters are important for early market entrants, and those might not be that price-sensitive; efficiency might not be so important to them. On the other hand, efficiency-centered business model design refers to efficient transactions (e.g., lower search costs for customers) and does not necessarily involve lower price tags for products or services. Early (product) adopters might enjoy and value increased transaction efficiency. Therefore the joint effect of early market entry and an efficiency-centered business model on TVA is likely to be indeterminate.

In summary, this analysis suggests that coupling an efficiency-centered business model with a product market strategy of cost leadership represents good fit, whereas the fit with either a product market strategy of differentiation or with early market entry cannot be clearly predicted.

DATA AND METHODS

Sample

We collected data on a sample of firms that had gone public in Europe or in the United States between April 1996 and May 2000. This sample selection strategy enabled us to create a dataset of about 300 firms that conducted part of their business over the Internet (e.g., firms like eTrade, Guess, and Priceline), and served as fertile ground to investigate Internet-enabled business models. These firms were likely to experiment with, and take advantage of, the possibilities that advanced information and communication technologies offered for the design of their business models. Consistent with the observation that such business models span firm and industry boundaries (Amit and Zott, 2001), we constructed a cross-industry sample.

We randomly sampled 170 firms on their business model characteristics and product market strategies. We considered companies that had recently gone public because at the time we conducted the study there were not many established firms in the public domain that used the Internet to enable their business models. Also, relatively young firms have fewer lines of business than older, more established corporations, and their business models are easier to describe and measure as they involve fewer transaction types and exchange partners. Data collection from initial public offering documents also ensured the availability and consistency of the data on business

[8] Again, the sign in parentheses gives the expected direction of change in that variable from a marginal increase in the degree of efficiency-centered business model design.

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models and business strategies. This is an acknowledged method for studying firms' strategies (e.g., Dowling and McGee, 1994).

Data collection

The data collection proceeded in two stages. In the first stage, we built composite scales for business model design themes, and we identified and measured the relevant items on the basis of a content analysis of IPO prospectuses. In the second stage, we followed a similar procedure to build composite scales for, and measure, relevant dimensions of product market strategies.

To determine the scales for the business model design themes, we relied on measurement scales developed by Zott and Amit (2007). To collect the data, we hired 11 part- or full-time research assistants (primarily MBA students), and trained them as expert raters to analyze assigned sample companies. We thus built on the common technique of using expert panelists in management research (see, for example, MacCormack, Verganti, and Iansiti, 2001). We carefully selected our raters and trained them in data collection and data analysis. On average, it took a rater about 2 days to collect data on a given business model, to understand the model, and to assess it. Data sources included primarily IPO prospectuses (Dowling and McGee, 1994), but also annual reports, investment analysts' reports, and Web sites. The business model data were collected from May 2000 to June 2001. During that period, we were able to take one measurement of the design themes for each of the business models in our sample. The lack of readily available data on business models obliged us to draw on primary sources of data and construct a unique, manually collected dataset; it also prevented us from collecting time-series data, which are preferable in studies that can draw on secondary sources of data (Bowen and Wiersema, 1999).

We validated inter-rater reliability by assigning a randomly chosen business model to two different expert raters, and by conducting a pair-wise comparison of responses, yielding a Cronbach alpha of 0.81, and a Pearson correlation coefficient of 0.72. Raters were in broad agreement with each other for 82 percent of the individual items. We repeated the test periodically, and found that all indicators of reliability improved further. We also purified the efficiency scale by dropping two items (see Appendix), which resulted in an improved reliability of the measure.

With respect to product market strategy scales, we drew on the strategy and management literature to establish measures of product market positioning through differentiation, cost leadership, and timing of market entry. We found that most of the empirical work on Porter's (1985) generic strategies, for example, had been conducted on the basis of surveys administered to managers. A few researchers (e.g., Dowling and McGee, 1994) have used IPO prospectuses to measure these items. We then adapted these survey-based instruments in order to analyze the content of our primary data source.

We iteratively selected items to measure product market strategy dimensions. We started with 51 items, derived from the literature, that measured various aspects of generic firm-level strategy. After pilot testing these items on our sample firms, we refined some items and dropped others, mainly on the basis of data availability. As a result of this process, and following further scale purification based on an exploratory factor analysis, we retained three items referring to differentiation and four items referring to cost leadership. We also retained a single-item measure for market-entry timing. Two raters then used these measures to analyze independently all 170 firms in our sample. The business strategy data were collected during the fourth quarter of 2003, using the same sources that we had consulted earlier to measure the business model design themes. Thus, our data reflect the product market strategies that sample firms had adopted between 2000 and 2001.

Inter-rater reliability on the business strategy measures was established by conducting a pairwise comparison of responses for five randomly chosen firms, yielding a Cronbach alpha of 0.92, and a Pearson correlation coefficient of 0.91. Raters were in agreement with each other on 77 percent of the individual items (on a five-point scale). All initial differences were resolved through discussions, so the final agreement was 100 percent.

Econometric modeling and estimation approach

We conducted a confirmatory factor analysis (CFA) and a partial least squares (PLS) regression analysis in order to establish the discriminant validity

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of our business model and product market strategy constructs. We then proceeded to analyze the data using multivariate regression techniques. We confirmed that conventional assumptions underlying ordinary least squares (OLS) regression analysis held in our dataset. First, after performing a logarithmic transformation of our dependent variable, we found that the null hypothesis of normality could not be rejected at the 5 percent level of significance using a Shapiro–Wilk test. Second, being concerned with heteroscedasticity in a cross-sectional study (see Bowen and Wiersema, 1999), we used White's general test to detect evidence of heteroscedasticity. We then corrected the p-values and t-statistics of estimates using White's variance–covariance matrix (White, 1980).

As a third measure to verify the validity of our model, we tested for multicollinearity among independent variables by calculating variance inflation factors (VIF) (Kleinbaum *et al.*, 1998) in regression models that contained only first-order terms *before* mean-centering our measures. The VIF levels that we observed were smaller than 2, hence much smaller than the critical threshold of 10, thus eliminating the concern about multicollinearity among first-order terms in the regression analysis. Multicollinearity may, however, arise due to the introduction of the interaction term, in which case mean centering can be applied to all first- and second-order variables as a standard and valid procedure to attenuate multicollinearity (Aiken and West, 1991). Interaction terms are entered as orthogonalized effects, and this approach yields interaction variables that are uncorrelated with their component variables. The VIF levels that we observed in regression models containing first- and second-order terms *after* mean centering our first-order measures were again all smaller than 2. Our model specification, therefore, proved robust to multicollinearity.

Independent variables

Two latent variables characterize the design themes of a business model (novelty and efficiency), and another three latent variables characterize the product market positioning of the firm (differentiation, cost leadership, and timing of entry). We used 13 items for novelty, 11 items for efficiency, three items for differentiation, four items for cost leadership, and one item for timing of market entry (see the Appendix for details on the scales). Given the difficulty of obtaining objective measures of business models and product market strategy, we deemed the use of perceptual measures obtained from expert raters appropriate (Dess and Robinson, 1984). The strength of each of these items was measured using five-point Likert-type scales, which we coded into a standardized score. After coding, we aggregated the item scores for each composite scale into an overall score using equal weights (Mendelson, 2000). This process yielded distinct quantitative measures of business model and product market strategy.

We validated the internal consistency and reliability of our measures using standardized Cronbach alpha coefficients, which were 0.71 for the business model novelty measure, 0.70 for the business model efficiency measure, 0.66 for the differentiation strategy measure, and 0.76 for the cost leadership strategy measure. Hence, our measures sufficiently satisfy Nunnally's (1978) guidelines, which suggest 0.7 as a benchmark for internal consistency.

Dependent variables

A firm's stock market value reflects the market's expectations of future cash flows to shareholders, and can be viewed as a measure of *perceived* firm performance, as opposed to *realized* performance, which is typically embodied in historical measures of firm profitability (e.g., ROI, ROA). Given the level of uncertainty often associated with the true prospects of firms that had a recent initial public offering (IPO), perceived performance operationalized as stock market value is a measure that is particularly germane to such a setting (Stuart, Hoang, and Hybels, 1999). Measures of realized performance, such as ROI, ROA, or Tobin's q, are less appropriate for these firms, which often have negative earnings, few tangible assets, and low (or even negative) book values. For instance, 134 firms in our sample (i.e., 86% of the sample firms for which we had the relevant accounting data) had negative earnings. Five firms (i.e., 3% of the sample firms for which we had the relevant data) even had a negative book value.[9]

[9] There are, of course, limitations in using stock market valuation as a dependent variable. The nature of our sample and the

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We took measurements of the dependent variable at various time periods: annual average 2000, and average during the fourth quarter (Q4) of 2000. These time periods correspond well to the measurement of the independent variables. Since most firms in our sample have relatively low levels of debt, the market value of a firm's equity is a good approximation of the market value of the whole firm. We measured the market value of equity at a given date as the number of shares outstanding multiplied by the firm's stock price, taken from the combined CRSP and Datastream databases. We then took the logarithm of the market value of the equity in order to comply with the normality assumption of OLS.

Control variables

We included further factors that might influence the market value of a firm's equity as control variables in the analysis because their omission might confound the analysis. On the firm level, we included variables that controlled for the age and size (i.e., the number of employees) of the firm. We also controlled for additional dimensions of a firm's strategy, such as the mode of market entry, and its product and market scope (see the Appendix for details on these variables). On the industry level of analysis we controlled for the degree of competition and estimated market size. Our raters measured the degree of competition on a four-point Likert scale based on information found in annual reports, prospectuses, competitors' SEC documents and Web sites, benchmark studies, Hoover's Database (which lists each focal firm's main competitors), as well as investment analysts' reports. The data on market size were obtained from Forrester and other research reports and from the U.S. Department of Commerce.[10] We also controlled for quadratic interaction effects among our main variables.

RESULTS

Descriptive statistics

Table 3 provides an overview of the data we use in this study. Our sample firms have an average age of 7 years (median of 4.3 years) in 2000, and a median of 270 employees. We note the large variance among sample firms as evidenced by the median, minimum, and maximum values of these variables. Our sample firms draw from relatively broad and highly competitive market segments and focus on a narrow array of products. There are few early entrants into the market among our sample firms. Our sample, thus, consists mostly of emerging growth companies that address relatively established markets.

Table 3 also lists the Pearson correlations among the variables used in the regression analysis. The correlations between a novelty-centered business model and a differentiation strategy (0.148), and between an efficiency-centered business model and a cost leadership strategy (−0.064) are low, which supports the argument that business model design themes and product market strategies are distinct. We also note that, while some correlations among explanatory variables are significant and relatively high (e.g., between age and entry mode: 0.488), they do not appear to pose a multicollinearity problem as the VIF are low for all these variables.

Confirmatory factor analysis and partial least squares regression

A basic premise of this study is that the business model is distinct from product market strategy (see the corollary in the subsection of this article

period in which we collected the data could prompt concerns about bias, due to an irrational bubble in the stock market. However, while the rationality of the markets during 1999–2000 remains an open question (e.g., Pastor and Veronesi, 2006, offer a rational explanation for investors' behavior and provide empirical evidence against the bubble hypothesis), our paper is not predicated on the efficiency of capital markets. It centers on the differential performance implications of alternative business model designs and product market strategies, and our estimation method exploits their differential valuation by capital markets. Even if the companies in our sample were systemmatically overvalued, this would not distort the qualitative results of our regression analysis.

[10] Some firms in our sample are first movers into new markets, relying on novelty-centered business models, which rendered measurement of these controls somewhat challenging. We estimated the market size and the degree of competition in these and other cases based on the information we could find in the various sources mentioned above. For example, in 2000 (the time period to which our independent and dependent variables refer) eBay did not have a serious direct competitor. The firm competed mainly with local online auctioneers (such as Ricardo in Europe), and with offline auction houses or even local flea markets. So we rated the degree of competitive threat it faced as low (0.25 on a scale from 0 to 1). We estimated the firm's market size as U.S. $4.7 billion based on Forrester and IDC reports dating from 2002, in which we found calculations on the market size for online auctioneering in 2000.

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Table 3. Pearson correlations and descriptive statistics

Variable name (acronym)	Novelty	Efficiency	Differentiation	Cost leadership	Entry timing	ln (market value avg. Q4 2000)	ln (market value avg. 2000)	Competition	ln (market size)	Age of firm	ln (employees)	Entry mode	Product scope	Market scope
Independent variable														
Novelty	1.000													
Efficiency	0.193*	1.000												
Differentiation	0.148†	0.053	1.000											
Cost leadership	−0.013	−0.064	−0.061	1.000										
Entry timing	0.238**	0.004	0.197*	0.164*	1.000									
Dependent variable														
ln (market value average Q4 2000)	0.176*	0.79	0.115	0.008	0.125	1.000								
ln (market value average 2000)	0.241**	0.120	0.279**	−0.037	0.170*	0.929**	1.000							
Control variable														
Competition	−0.476**	−0.198**	−0.151*	0.025	−0.148†	−0.148†	−0.189*	1.000						
ln (market size)	−0.065	−0.004	−0.260**	0.094	−0.052	0.217**	0.105	0.179*	1.000					
Age of firm	−0.135†	−0.101	−0.295**	0.072	−0.026	0.219**	0.044	0.071	0.191*	1.000				
ln (employees)	0.067	−0.027	−0.164*	0.11	−0.016	0.632**	0.547**	0.012	0.339**	0.459**	1.000			
Entry mode	0.069	−0.037	0.443**	−0.068	0.075	−0.163*	0.014	0.007	−0.222**	−0.488**	−0.301**	1.000		
Product scope	−0.060	−0.016	0.009	0.054	0.092	−0.093	−0.144†	0.073	−0.076	0.106	−0.140†	−0.134†	1.000	
Market scope	0.155*	0.107	−0.131†	−0.153*	−0.060	−0.012	−0.026	−0.136†	0.045	0.031	−0.035	−0.145†	0.100	1.000
Descriptive statistics														
Mean	0.382	0.742	3.598	2.657	2.147	517	883	0.624	22410	7.0	1145	3.971	3.765	1.871
Median	0.372	0.750	3.667	2.500	1	77	183	0.639	5400	4.3	270	4	4	1
S.D.	0.138	0.124	0.796	1.028	1.590	1491	2262	0.175	69111	7.9	3749	1.275	1.011	1.047
Min.	0.077	0.386	1.667	1	1	2	5	0	120	0.4	17	1	1	1
Max.	0.814	1	5	5	5	12304	16651	0.972	744000	46	31000	5	5	5
N	170	170	170	170	170	161	169	170	170	170	170	170	170	170

Note on descriptive statistics: (1) The independent variables are indices that have been coded so that low values represent a low emphasis, and high values represent a high emphasis on the respective business model design theme, or product market strategy. High values of Entry timing indicate early market entry timing. (2) Market value and market size are given in U.S. $ millions, without taking the logarithm. (3) Firm size is given as number of employees, without taking the logarithm. (4) High values of Entry mode indicate high reliance on strategic partnerships and/or joint ventures in developing, producing, or marketing products. (5) High values of Product scope indicate a highly focused product offering. (6) High values of Market scope indicate a very focused market approach.

$^{**}p < 0.01$, $^{*}0.01 <= p < 0.05$, $^{\dagger}0.05 <= p < 0.1$

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entitled 'The business model: a new structural concept'). Since the business model is a relatively new construct for strategic management research, it is incumbent upon us to validate that claim empirically through establishing the discriminant validity of our main constructs. To do so, we performed two sets of analyses: confirmatory factor analysis (CFA), and partial least squares regression (PLS). If the results from these analyses converge, this provides strong support for our corollary.

We first conducted the confirmatory factor analytic method proposed by Gatignon *et al*. (2002). The method consists of selecting pairs of constructs and then conducting CFA for each pair. In applying this method, we first ran a CFA for each pair of factors in an unconstrained measurement model. In this first model, the correlation between the factors was estimated. Take novelty and differentiation as the chosen pair of factors. Novelty traits loaded onto the novelty factor, and the differentiation traits loaded onto the differentiation factor. Table 4 depicts the results from this analysis in the rows where the correlation between the factors is reported as freely estimated (i.e., not set equal to 1). For example, the estimated correlation between novelty and differentiation was 0.19.

We then ran a CFA on a measurement model with only one factor, where the correlation between the constructs of interest was constrained to be 1. If the unconstrained model, where the correlation is freely estimated, improves the fit significantly compared to the constrained model, the two constructs are distinct from each other, although they can still be significantly correlated (Gatignon *et al*., 2002; Gatignon, 2003). To illustrate this, consider novelty and differentiation. The results from the CFA demonstrate that novelty-centered business model and differentiation in product markets are distinct constructs, although they are positively correlated. This is confirmed by a significantly (at the 0.01 level) improved confirmatory factor analytic model when the correlation is estimated, compared to a measurement model where the correlation is constrained to 1 (chi-squared $= 260 - 186 = 74$, degrees of freedom $= 104 - 103 = 1$). As Table 4 shows, we obtain similar results for all other pairs involving generic product market strategies and business model design themes, which provides support for our corollary.[11]

In addition to CFA, the literature suggests PLS as another method for assessing discriminant validity. Using PLS, one can determine whether a construct shares more variance with its measures than it shares with other constructs in the model (Hulland, 1999). This is achieved by: (1) calculating the square roots of the average variance extracted (AVE) values, which measure the average variance shared between a construct and its measures; and by (2) calculating the correlations between different constructs. A matrix can then be constructed where the square root of AVE is in the diagonal, and the correlations between the constructs are in the off-diagonal. This matrix is shown in Table 5. For adequate discriminant validity, the diagonal elements should be greater than the off-diagonal elements in the corresponding rows and columns

[11] We note that the CFA can also be used to assess the convergent validity of the constructs (Gatignon *et al*., 2002; Gatignon, 2003), which we have confirmed in a separate analysis that is available upon request.

Table 4. Pair-wise confirmatory factor analysis

	Low-cost strategy				Differentiation strategy			
	Correlation	Chi-squared	d.f.	*p*-value	Correlation	Chi-squared	d.f.	*p*-value
Efficiency	0.05	143.19	89	0	0.22	131.99	76	0
	1	377.07	90	0	1	214.32	77	0
Novelty	0.07	193.89	118	0	0.19	186.26	103	0
	1	418.34	119	0	1	260.00	104	0

The number of degrees of freedom (d.f.) for the chi-square test is calculated as $N_{var} \times (N_{var} + 1)/2 - N_{par}$, where N_{var} is the number of variables (i.e., the items for each scale) and N_{par} is the number of parameters to be estimated. For each variable we estimate a theta–delta and a lambda–X, and—if not constrained to 1—we also estimate the correlation between the constructs. Lambda–X is the matrix of factor loadings and theta–delta is the column vector of measurement errors (Gatignon, 2003: 164). For example, in the case of novelty and differentiation strategy, when the correlation between these constructs is fixed to one, $N_{var} = 13$(items for novelty) $+ 3$(items for differentiation) $= 16$, and $N_{par} = 32$, hence d.f. $= N_{var} \times (N_{var} + 1)/2 - N_{par} = 16 \times (16 + 1)/2 - 32 = 136 - 32 = 104$.

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Table 5. Partial least squares analysis

	Differentiation	Cost leadership	Efficiency	Novelty
Differentiation	**0.577**	−0.061	0.053	0.148
Cost leadership	−0.061	**0.500**	−0.064	−0.013
Efficiency	0.053	−0.064	**0.302**	0.193
Novelty	0.148	−0.013	0.193	**0.277**

The table depicts the square root of average variance extracted on the diagonal, and correlations on the off-diagonal.

(Fornell and Larcker, 1981). This is the case here, and is further evidence in support of the discriminant validity of our constructs.

Hierarchical OLS regressions

Tables 6 and 7 show the results of selected hierarchical OLS regression runs. Table 6 (Model 1) supports the prediction that coupling a novelty-centered business model with a differentiation product market strategy represents good fit; these variables jointly produce a significant positive effect on performance. Furthermore, Table 6 (Model 2) supports the hypothesized good fit between novelty-centered business models and cost leadership strategy (albeit only at the 10% level of significance), and we also find support (see Model 3) for a positive interaction between novelty-centered business models and early market entry timing. Regarding the fit between efficiency-centered business models and product market strategies, however, our empirical analysis (as shown in Model 4) does not support the expected good fit between efficiency-centered business models and cost leadership strategy; it produced insignificant results. We performed additional analyses, not shown in detail here, in which we did not find any statistically significant interaction terms involving efficiency-centered business models and product market differentiation or early market timing, which suggests neither good nor bad fit between these variables. These results are consistent with our model.

We conducted further sensitivity analyses on the significant effects by testing different models and different dependent variables. Some of these are shown in Table 7, which reports results for models that included the interaction between a novelty-centered business model and a strategy of early market entry. For example, Table 7 panel (A) refers to regressions that used the logarithm of market value averaged over the fourth quarter of 2000, and panel (B) refers to regressions that used the logarithm of market value averaged over the entire year 2000. A comparison of panels (A) and (B) reveals that the results from our analyses were consistent across different measurements of the dependent variable, albeit at different levels of statistical significance, which confirmed the complementary nature of the particular business model–product market strategy interaction. In particular, concerning the interactions between novelty-centered business models and various product market strategies, we found that our data produce a positive coefficient on the relevant interaction terms in all regressions that we ran. That coefficient is statistically significant at the 5 percent level in a majority (though not all) of the models.

To corroborate and examine the results from these models further, we performed *post hoc* analysis using plotting techniques suggested by Aiken and West (1991). Consider, for example, the results on the interaction between product market differentiation and novelty-centered business model design reported in the top panel of Table 6, Model 1. The plots of differentiation on performance for different values of novelty (mean value, one standard deviation below the mean, one standard deviation above the mean) revealed that for higher values of novelty the slope of the plotted regression line was larger, and positive (see Figure 1). The plots of novelty on performance for different values of differentiation (mean value, one standard deviation below the mean, one standard deviation above the mean) revealed similar qualitative results, as well as the additional insight that the observed positive interaction effect between differentiation strategy and novelty-centered business model design is powerful: it trumps the independent effect of novelty-centered design on performance (see Figure 2). The slope of the regression

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Table 6. OLS regressions to test interactions between business model design themes and product market strategies (dependent variable: ln (market value avg. quarter 4, 2000))

RHS variables	Model 1 Estimate (S.E.)	Model 2 Estimate (S.E.)	Model 3 Estimate (S.E.)	Model 4 Estimate (S.E.)	Model 5 Estimate (S.E.)
Constant	−0.19	−0.37	−0.39	−0.47	−0.29
Independent variables					
Novelty	1.26†	1.45†	1.31†	1.67*	0.93
	(0.93)	(0.92)	(0.98)	(0.96)	
Efficiency	0.95	0.63	0.84	0.76	1.34†
					(0.82)
Differentiation	1.80***	1.92***	1.99***	2.02***	1.77***
	(0.50)	(0.53)	(0.53)	(0.55)	(0.52)
Cost leadership	−0.44	−0.35	−0.43	−0.42	−0.47
Timing of entry	0.16	0.15	0.04	0.19	−0.01
Control variables					
Competition	−0.48	−0.66	−0.25	−0.40	−0.12
log (market size)	0.071	0.08	0.06	0.08	0.07
Age	−0.01	−0.01	−0.01	−0.01	−0.01
log (employees)	0.85***	0.87***	0.85***	0.87***	0.80***
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Mode of entry	−0.36	−0.31	−0.42	−0.34	−0.44
Product scope	−0.02	0.02	−0.06	0	−0.04
Market scope	−0.12	−0.06	0.13	−0.04	0.03
Interactions					
Novelty* Differentiation	11.07*				10.61*
	(5.05)				(5.19)
(Novelty* Differentiation)^2	−158.92				−122.8
Novelty* Cost leadership		3.91†			3.17
		(2.80)			
(Novelty* Cost leadership)^2		−13.81			−24.87
Novelty* Timing of entry			4.68*		3.63†
			(2.24)		(2.49)
(Novelty* Timing of entry)^2			8.32		18.90
Efficiency* Cost leadership				4.00	2.86
(Efficiency × Cost leadership)^2				−16.97	−9.09
R^2	0.52	0.51	0.52	0.51	0.55
Adj. R^2	0.47	0.46	0.48	0.46	0.48
N	161	161	161	161	161
F	11.18***	10.76***	11.39***	10.67***	8.40***

*** $p < 0.001$; ** $p < 0.01$; * $0.01 \leq p < 0.05$; †$0.05 \leq p < 0.1$.

line is negative for low values of differentiation, and becomes positive for high values of differentiation. In other words, the plots shown in Figures 1 and 2 show a positive interaction effect, which suggests that a novelty-centered business model and a differentiation strategy are complements, not substitutes.[12]

Finally, we note that even when the interaction terms reported in Tables 6 and 7 were statistically significant, the coefficients on some of the corresponding main variables were insignificant. This corroborates the importance of considering interactions between product market strategies and business models, over and above their independent effects on firm performance.

[12] The slopes of the simple regression lines shown in Figures 1 and 2 differ significantly from one another. Aiken and West (1991: 19ff.) demonstrate formally that the corresponding t-test is equivalent to testing the significance of the coefficient of the interaction term in the regression. Since we observed a statistically significant coefficient of the interaction term in the regression (see Table 6), the corresponding slopes are significantly different from each other in the plots provided in Figures 1 and 2.

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Table 7. Hierarchical OLS regressions to test robustness of novelty/timing of entry interaction

(A) Dependent variable ln (market value avg. quarter 4, 2000)

RHS variables	Model 6 Estimate (S.E.)	Model 7 Estimate (S.E.)	Model 8 Estimate (S.E.)	Model 9 Estimate (S.E.)
Constant	4.46***	4.41***	−0.21	−0.39
Novelty	1.62†	1.47	1.65*	1.31†
	(1.20)		(1.00)	(0.98)
Timing of entry	0.28	0.16	0.15	0.04
Novelty * Timing of entry	6.65**	5.41*	4.39*	4.68*
	(2.76)	(2.86)	(2.39)	(2.24)
(Novelty* Timing of entry)^2		20.30	6.75	8.32
Competition			−0.53	−0.25
log(market size)			0.02	0.06
Age			−0.02	−0.02
log(employees)			0.86***	0.85***
			(0.09)	(0.09)
Differentiation				1.99***
				(0.53)
Cost leadership				−0.43
Efficiency				0.84
Mode of entry				−0.42
Product scope				−0.06
Market scope				0.13
R^2	0.07	0.08	0.48	0.52
Adj. R^2	0.06	0.06	0.45	0.48
N	161	161	161	161
F	4.33**	3.40*	17.36***	11.39***

(B) Dependent variable ln (market value avg. 2000)

RHS variables	Model 6 Estimate (S.E.)	Model 7 Estimate (S.E.)	Model 8 Estimate (S.E.)	Model 9 Estimate (S.E.)
Constant	5.35***	5.31***	1.92**	1.08†
Novelty	2.00*	1.87*	1.82*	1.35†
	(1.05)	(1.08)	(0.87)	(0.82)
Timing of entry	0.34	0.25	0.24	0.09
Novelty * Timing of entry	5.82**	4.82*	3.55†	3.28†
	(2.33)	(2.58)	(2.30)	(1.99)
(Novelty * Timing of entry)^2		16.34	11.22	14.10
Competition			−0.34	−0.05
log(market size)			−0.06	−0.01
Age			−0.04	−0.03
log(employees)			0.78***	0.80***
			(0.08)	(0.08)
Differentiation				2.43***
				(0.40)
Cost leadership				−0.53
Efficiency				1.08*
				(0.65)
Mode of entry				0.06
Product scope				−0.21
Market scope				0.21
R^2	0.11	0.11	0.46	0.56
Adj. R^2	0.09	0.09	0.43	0.52
N	169	169	169	169
F	6.86***	5.28***	16.88***	13.88***

*** $p < 0.001$; ** $p < 0.01$; * $0.01 \leq p < 0.05$; †$0.05 \leq p < 0.1$.

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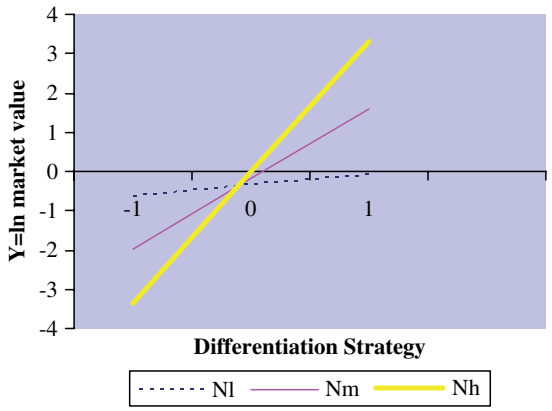

Figure 1. Plot of differentiation on performance for different values of novelty (mean value, N_m, one standard deviation below the mean, N_l, one standard deviation above the mean, N_h). This figure is available in color online at www.interscience.wiley.com/journal/smj

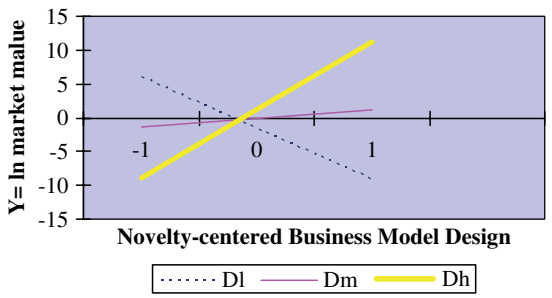

Figure 2. Plot of novelty on performance for different values of differentiation (mean value, D_m, one standard deviation below the mean, D_l, one standard deviation above the mean, D_h). This figure is available in color online at www.interscience.wiley.com/journal/smj

DISCUSSION AND CONCLUSION

Our theoretical and empirical analysis reveals that a firm's product market strategy and its business model are distinct constructs that affect the firm's market value. We show the discriminant validity of the business model construct and, using hierarchical OLS regression techniques, we find significant effects of its interaction with product market strategy on the perceived performance of firms, as measured by market capitalization. More specifically, we find positive interactions (at various levels of statistical significance) between novelty-centered business models and various product market strategies, such as cost leadership. This suggests that although a firm may get 'stuck in the middle' between two product market strategies such as differentiation and cost leadership (Porter, 1985), and also between two business model design themes such as novelty and efficiency (Zott and Amit, 2007), the same need not be true for a combination of product market strategy (e.g., cost leadership) and business model design theme (e.g., novelty). Our empirical analyses suggest that these concepts are complements rather than substitutes.

With respect to efficiency-centered business models, however, our analysis did not provide support for the expected positive interaction between an efficiency-centered business model and cost leadership strategy. Our other empirical findings on efficiency-centered business models were consistent with the formal model: they did not reveal any complementarities with a differentiation strategy or with the timing of entry, and indeed no clear predictions can be made with respect to any such relationship.

We believe that our study makes several important contributions. First, we establish the contingent role of a firm's business model in the determination of its market value. In doing so, we extend the scholarly inquiry into structure as a contingency factor. Whereas the traditional focus in the received literature has been on the firm's internal administrative structure, our analysis centered on boundary-spanning transactions between a focal firm and its ecosystem of partners, customers, and suppliers. We show that adopting a broader view of organizations—one that transcends traditional firm boundaries—can be valuable for understanding wealth creation and performance. By doing so, our study may inspire new research on the relationship between strategy and structure, and on the boundaries of firms.

Second, we explore the fit between a focal firm's business-level product market strategy and the design themes of its business model. We elaborate on the notion of 'good fit' between these constructs by offering a formal model and by performing a marginal effects analysis within our model. This constitutes a theoretical extension of the literature on the fit between strategy and structure.

Third, by empirically testing the model our study underscores the complementary nature of the business model and product market strategy relationship. It thereby highlights the need to examine the firm's business model as a source of competitive advantage. We suggest that competitive advantage

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can emerge from superior product market positioning, as well as from the firm's business model. That is, although the business model is a structural construct, it is of strategic importance to the firm. Indeed, the empirical results presented in this paper show that both can enhance the firm's performance, independently as well as jointly, which supports previously held conjectures (e.g., Christensen, 2001). Our study points to the need to investigate competition among various business models within an industry (Markides and Charistou, 2004) in addition to considering product market competition. Such rivalry on a business model level may have implications both for the wealth creation potential of a given business model and for value capture by the focal firm. In order to understand these phenomena better, we need to know more about the strategic effects of business models and how they influence the positioning of firms in their competitive environment.

Finally, our study raises the issue of timing of business model and product market strategy design. They may be determined simultaneously. For example, when entrepreneurs and managers define and refine their business models, they may concurrently identify customer needs and map them against the products and services offered by competitors (McGrath and MacMillan, 2000). However, it is also conceivable that product market strategy follows business model design, or vice versa. Little research has been conducted so far on how business models evolve and in particular how they coevolve with the product market strategy of the firm. In this study, we hope to have laid some of the foundations necessary to explore fruitfully these new avenues for research.

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Appendix: Scale Composition

Items composing efficiency-centered business model design theme scale	Scale (code)	Retained in final scale	Mean	S.D.	Min.	Max.
Inventory costs for participants in the business model are reduced	Strongly agree (1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.79	0.25	0	1
Transactions are simple from the user's point of view	Strongly agree (1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.80	0.23	0	1
The business model enables a low number of errors in the execution of transactions	Strongly agree (1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.68	0.25	0	1
Costs other than those already mentioned for participants in the business model are reduced (e.g., marketing and sales, transaction processing, communication costs)	Strongly agree (1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.51	0.34	0	1
The business model is scalable (i.e., can handle small as well as large number of transactions)	Strongly agree (1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.80	0.22	0	1
The business model enables participants to make informed decisions	Strongly agree (1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.82	0.18	0.25	1
Transactions are transparent: flows and use of information, services, goods can be verified	Strongly agree (1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.78	0.24	0	1
As part of transactions, information is provided to participants to reduce the asymmetric degree of knowledge among them regarding the quality and nature of the goods being exchanged	Strongly agree (1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.71	0.27	0	1
As part of transactions, information is provided to participants about each other	Strongly agree (1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.66	0.28	0	1
Access to a large range of products, services and information, and other participants is provided	Strongly agree (1), Agree (0.75), Disagree (0.25), Strongly disagree (0)		0.85	0.23	0	1
The business model enables demand aggregation	Yes (1), No (0)		0.12	0.32	0	1
The business model enables fast transactions	Strongly agree (1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.81	0.25	0	1
The business model, overall, offers high transaction efficiency	Strongly agree (1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.79	0.22	0	1
Reliability α	0.70					

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(*Continued*)

Items composing novelty-centered business model design theme scale	Scale (code)	Retained in final scale	Mean	S.D.	Min.	Max.
The business model offers new combinations of products, services and information	Strongly agree (coded as 1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.42	0.30	0	1
The business model brings together new participants	Strongly agree (coded as 1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.27	0.22	0	1
Incentives offered to participants in transactions are novel	Strongly agree (coded as 1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.32	0.25	0	1
The business model gives access to an unprecedented variety and number of participants and/or goods	Strongly agree (coded as 1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.39	0.30	0	1
The business model links participants to transactions in novel ways	Strongly agree (coded as 1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.32	0.24	0	1
The richness (i.e., quality and depth) of some of the links between participants is novel	Strongly agree (coded as 1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.36	0.27	0	1
Number of patents that the focal firm has been awarded for aspects of its business model	0 (0), 1–2 (0.33), 3–4 (0.66), >4 (1)	√	0.054	0.19	0	1
Extent to which the business model relies on trade secrets and/or copyrights	Radically (1), Substantially (0.66), A bit (0.33), Not at all (0)	√	0.52	0.28	0	1
Does the focal firm claim to be a pioneer with its business model?	Yes (1), No (0)	√	0.4	0.49	0	1
The focal firm has continuously introduced innovations in its business model	Strongly agree (coded as 1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.6	0.33	0	1
There are competing business models with the potential to leapfrog the firm's business model	Strongly agree (coded as 1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.47	0.30	0	1
There are other important aspects of the business model that make it novel	Strongly agree (coded as 1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.30	0.27	0	1
Overall, the company's business model is novel	Strongly agree (coded as 1), Agree (0.75), Disagree (0.25), Strongly disagree (0)	√	0.53	0.31	0	1
Reliability α	0.71					

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(*Continued*)

Items composing differentiation strategy scale	Scale	Retained in final scale	Mean	S.D.	Min.	Max.
Importance and use of product–service-related patents	SCALE: 1 = not important at all, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important	√	3.05	1.30	1	5
Importance of new product development, innovation and R&D activity	SCALE: 1 = not important at all, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important		4.24	1.01	1	5
Emphasis on growth by acquiring, or merging with R&D/technology intensive firms	SCALE: 1 = not important at all, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important		3.45	1.30	1	5
Branding and advertising as part of firm's marketing strategy/approach	SCALE: 1 = not important at all, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important	√	4.15	1.23	1	5
Differentiation strategy	SCALE: 1 = do not use this strategy at all, 2 = strategy is not important, 3 = use this strategy a bit, 4 = employ this strategy, 5 = very important strategy	√	3.59	0.55	1	5
Reliability α	0.66					

Items composing cost leadership strategy scale	Scale	Retained in final scale	Mean	S.D.	Min.	Max.
Offering products/services at low prices/prices lower than competition	SCALE: 1 = not important at all, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important	√	3.18	1.55	1	5
Minimizing product-related expenditures, in particular through process innovations	SCALE: 1 = not important at all, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important	√	2.79	1.57	1	5
Emphasizing economies of scale and scope with products and services	SCALE: 1 = not important at all, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important	√	1.82	1.37	1	5

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(*Continued*)

Items composing cost leadership strategy scale	Scale	Retained in final scale	Mean	S.D.	Min.	Max.
Low-cost strategy	SCALE: 1 = do not use this strategy at all, 2 = strategy is not important, 3 = use this strategy a bit, 4 = employ this strategy, 5 = very important strategy	√	2.84	1.02	1	5
Reliability α	0.76					

Items for other strategy variables	Scale	Retained in final scale	Mean	S.D.	Min.	Max.
Timing of market entry (being the first to enter a market, and/or first to introduce products or services in a market, or realizing first mover advantage in another way)	SCALE: 1 = not important at all, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important	√	2.15	1.59	1	5
Mode of market entry (relying on strategic partnerships, and joint ventures in order to develop, produce, distribute, or market products/services)	SCALE: 1 = not important at all, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important	√	3.97	1.27	1	5
Breadth of product offering (pursuing a narrow, focused product scope)	SCALE 1: 1 = not important at all, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important	√	3.76	1.01	1	5
Breadth of targeted market segments (pursuing a narrow, focused market scope)	SCALE: 1 = not important at all, 2 = slightly important, 3 = moderately important, 4 = important, 5 = very important	√	1.87	1.05	1	5

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