



# Innovation and performance outcomes of market information collection efforts: The role of top management team involvement

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## ABSTRACT

Research on organizational market information processing in marketing has not yet examined a key issue associated with information collection: the role of top management team (TMT) involvement. Research in marketing has typically studied market information collection efforts from the perspective of employees and market research companies, overlooking the role that the TMT plays in these efforts. While prior research on top managers suggests that they are often not active participants in the collection of market information, this study examines whether and under what conditions TMT involvement in market information collection efforts can contribute to a firm's innovativeness and performance. The key contribution of the study involves the development and testing of a model that shows (1) the positive effect of TMT involvement in market information collection efforts on firm innovativeness above and beyond employees' market information collection efforts; (2) the moderating effect of firm size and industry context (i.e., high-technology versus low-technology) on model relationships, indicating that the relationship is stronger for smaller firms and high-technology companies; and (3) the mediating effect of firm innovativeness on the relationship between TMT involvement in market information collection efforts and overall business performance. We test our model in a business-to-business context.

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## 1. Introduction

The organizational processing of market information is an important research area in marketing (Moorman, 1995; Olson, Walker, & Ruekert, 1995; Sinkula, 1994). Prior research has found market information to be strongly associated with a firm's ability to effectively implement marketing strategies (Noble & Mokwa, 1999), develop successful new products (Olson et al., 1995), enhance organizational learning (Sinkula, 1994) and achieve superior business performance (Li & Calantone, 1998; Narver & Slater, 1990). Research in marketing has addressed market information processing from two key perspectives. The first stream of research has focused on the individual decision-maker and studied the effect of information and organizational characteristics on her/his performance and information use (e.g., Deshpandé & Zaltman, 1982; Moorman, Zaltman, & Deshpandé, 1992). The second perspective suggests that the way in which market information is collected and utilized is strongly influenced by organizational systems and processes and that an organization's ability to process and learn from market

information extends beyond the capacity of individual organizational members (e.g., Jaworski & Kohli, 1993; Moorman, 1995; Sinkula, 1994).

Although these streams of research have enriched our understanding of market information processing in organizations, they have yet to fully examine issues that are associated with information collection. Indeed, information collection is "the most important element of market information processing because without it there is no opportunity for the firm to keep abreast of its customer and competitor environments" (Sinkula, Baker, & Noordewier, 1997: 308). Furthermore, information collection is a precondition for other information-processing activities such as dissemination and utilization (Deeter-Schmelz & Ramsey, 2003). One under-studied important issue in the context of market information collection involves the top management team (TMT)'s involvement in the collection effort.

Although market information is particularly necessary for strategy selection and implementation, and although the TMT comprises the key decision-makers in the organization, research on TMTs suggests that top managers are typically not active participants in the collection of market information (Collins & Clark, 2003; Yadav, Prabhu, & Chandy, 2007). Research on market information collection efforts has mostly entailed the study of standard market research techniques (e.g., customer survey administration and secondary market data collection); such efforts are typically employed and managed by the firm's employees or by market research companies (e.g., Jaworski & Kohli, 1993; Li & Calantone, 1998;

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Moorman, 1995). Top managers are thus often expected to be exposed only to the final outcome of the market research (e.g., a summary report on customer satisfaction compiled by a market research company or the firm's marketing team; Deshpandé & Zaltman, 1982; Kotter, 1999; Moorman et al., 1992). Top managers often do not have the time to be involved in information collection or closely supervise information collection efforts and therefore are less likely to put their hands on 'raw' market information (Kotter, 1999; Moorman et al., 1992; Ritchie & Ritchie, 2002). They are also often removed from the day-to-day interactions with customers (Peñaloza & Gilly, 1999), which may hinder their ability as managers to 'get a good sense' of the market information (Hough & White, 2004; Yadav et al., 2007). Furthermore, important pieces of information may sometimes not even reach them, which might limit effective decision-making (Brown & Ennew, 1995; Zahay, Griffin, & Fredericks, 2004). This may result in gaps between the priorities of top management and employees (Moorman & Rust, 1999), making it difficult to effectively implement marketing programs (Slotegraaf & Dickson, 2004).

Thus, in this paper we address an under-researched question that has recently attracted attention in the marketing literature (e.g., Auh & Menguc, 2005; Yadav et al., 2007): what is the impact of the TMT on firm behavior and performance? Specifically, we aim to provide a better understanding of how TMT involvement in market information collection efforts impacts the firm. We are particularly interested in the impact on firm innovativeness. We focus on innovativeness because it is a key element of firms' competitive advantage and superior performance, and because the TMT shapes the firm's innovation goals and provides direction for the implementation of new product development (NPD) processes (Elenkov, Judge, & Wright, 2005; Yadav et al., 2007).

Our approach is consistent with recent calls in the marketing and management literatures, particularly research on upper echelons theory (Hambrick & Mason, 1984). While this theoretical framework provides a rich research tradition considering the impact of TMT characteristics on firm performance (e.g., manager demographics, diversity in the TMT), prior upper echelons research offers inconclusive findings. To gain a deep understanding of the TMT's impact on the firm, it is important to study not only managers' surface characteristics, such as educational background or age, but also the TMT's actual behavior (Cannella Jr., Park, & Lee, 2008; Jehn, Northcraft, & Neale, 1999; Lovelace, Shapiro, & Weingart, 2001; Simons, Pelled, & Smith, 1999). Hence, it is pertinent to study TMT involvement in a key dimension of information processing: market information collection.

We commence by highlighting the relevant research on market information and the TMT and introduce our set of hypotheses. We then develop and test our model on a sample of 97 business-to-business (B2B) firms. In this study, we focus on customer information. The reason is that customers have been acknowledged to be the central source of firm revenue and customer information, the most important component of market information that firms collect (Deshpandé & Farley, 1998).

## 2. Theoretical background and construct definitions

### 2.1. Market information

Market information is defined as external data concerning a firm's current and potential external stakeholders (Moorman, 1995). Prior research in marketing has studied market information processing at the individual decision-maker level (e.g., Deshpandé & Zaltman, 1982; Moorman et al., 1992) and at the organizational level (e.g., Kyriakopoulos & Moorman, 2004; Sinkula, 1994). In this study, we focus on the latter perspective, which suggests that the way market information is collected and used is a function of organizational systems and processes (Moorman, 1995). This line of research contends that market information processing is comprised of a series of organizational processes. While their labels vary across studies, three central processes can be identified: information collection (also

referred to as acquisition, generation and gathering), information transmission (also referred to as dissemination and distribution), and information utilization (also referred to as interpretation, integration and responsiveness) (Jaworski & Kohli, 1993; Li & Calantone, 1998; Moorman, 1995; Sinkula, 1994).

The importance of market information processing is repeatedly emphasized in market orientation research. This research area examines the behavior of market-oriented firms (i.e., the collection of market information, the transmission of this information within the organization, and its ultimate utilization) and how these processes impact business performance (Kohli & Jaworski, 1990; Narver & Slater, 1990). Market information provides the basis for shared values and beliefs in market-oriented firms, determines norms of behavior, and helps employees better understand their environment and their organization. In turn, these behaviors and processes contribute to the firm's ability to create customer value, outperform the competition and achieve superior market outcomes (Jaworski & Kohli, 1993; Kirca, Jayachandran, & Bearden, 2005).

Within the market information-processing framework, a central dimension is the collection effort. This is an important driver of information transmission and utilization, and it is crucial for knowledge development and organizational learning (Deeter-Schmelz & Ramsey, 2003; Kyriakopoulos & Moorman, 2004; Sinkula, 1994; Sinkula et al., 1997). Day (1994) refers to market information collection as *boundary-spanning activities* that involve sensing the market environment. These spanning activities ultimately allow firms to respond to and alter the market, and to attain competitive advantage through innovations as market intelligence is developed and bolstered (Droge, Calantone, & Harmancioglu, 2008). These notions were corroborated in Day and Wensley's (1988) source-position-performance (SPP) framework, which proposes a *mediating* impact of the quality of implementation on the conversion of distinctive resources into competitive advantage. More specifically, they contend that superior resources (e.g., market information) and skills (e.g., TMT involvement in market information collection) may not be automatically converted into positional advantages or bring about a certain performance payoff, but may instead be mediated by the quality of implementation (e.g., firm innovativeness). Furthermore, the SPP framework highlights the firm's internal characteristics (e.g., firm size) and the external competitive environment (e.g., industry context) as the determinants of this conversion (Song & Parry, 1997).

### 2.2. TMT: Upper echelons theory

The TMT is defined as the organization's top tier members. These key executives provide guidelines and direction for critical strategic decisions; they are viewed as the driving force behind the firm's behavior and performance (Auh & Menguc, 2005; Hambrick & Mason, 1984).

The influence of top managers on firm performance remains one of the most widely studied relationships in management (Certo et al., 2006; Hambrick, 2007). This literature is largely based on Hambrick and Mason's (1984) theory of upper echelons, examining the individuals responsible for the organization and advocating positive relationships between a variety of TMT demographic indicators and firm outcomes. The theory suggests that observable characteristics of the TMT, such as age, education or experience, are good surrogates for psychological and cognitive traits, and that they influence firm results (Camelo-Ordaz, Hernandez-Lara, & Valle-Cabrera, 2005; Hambrick, 2007). While there is empirical support for this perspective, recent research emphasizes the equivocal nature of the findings (e.g., Elenkov et al., 2005; Simons et al., 1999). A possible explanation for the mixed findings is that it is not the TMT characteristics per se that impact firm results but the actual processes that may be developed through TMT decision-making or TMT behavior (Camelo-Ordaz et al., 2005; Elenkov et al., 2005; Jehn et al., 1999). Thus, research on TMTs

has recently begun exploring the relationship between firm performance and TMT behaviors such as TMT agreement-seeking and consensus, behavioral integration, informal communication, conflict resolution and decision comprehensives (e.g., Camelo-Ordaz et al., 2005; Hambrick, 2007; Jehn et al., 1999; Lovelace et al., 2001; Simons et al., 1999). In line with this research, we study TMT behavior in the context of market information collection efforts, linking it to firm innovativeness and performance.

2.3. TMT and market information

Market information is often at the heart of decision-making (Collins & Clark, 2003). Prior research suggests that firms concentrating on the external environment, as opposed to their internal organization, attain greater market success (Day & Nedungadi, 1994; Yadav et al., 2007). Research on market orientation further suggests that top managers are the most significant organizational actors and foster the focus on market information, particularly customer information (Jaworski & Kohli, 1993; Kohli & Jaworski, 1990). Still, top managers are generally not highly involved in, or do not closely supervise, the information collection process (Kotter, 1999; Ritchie & Ritchie, 2002). The reasons include TMTs' lack of time and/or limited attention, which often leads them to put emphasis only on certain types of information (Day & Nedungadi, 1994) and focus on strategic rather than tactical tasks (Yadav et al., 2007). As a result, top managers might not always be able to 'get a good sense' of market information or receive important tacit information.

Tacit information (e.g., information on business customers' corporate culture) is particularly important for firms because this type of information, which is non-verbalizable, intuitive, unarticulated, difficult to formalize and communicate, and learned through collaborative experience, can help firms become more innovative and gain competitive advantage (Cao, Maruping, & Takeuchi, 2006; Cavusgil, Calantone, & Zhao, 2003; Mehra, Dixon, Brass, & Robertson, 2006). Tacit information helps managers identify latent customer needs, customers' decision-making processes and new market opportunities. Furthermore, the nature of tacit information is often associated with informal communication, which is viewed as a critical process for innovation (Bendapudi & Leone, 2002; Cavusgil et al., 2003; Kyriakopoulos & Moorman, 2004; Li & Calantone, 1998). Thus, top managers who gain direct access to tacit information are those that put effort into developing and maintaining both formal and informal (i.e., interpersonal) relationships with customers and other stakeholders (Haytko, 2004; Homburg & Stock, 2004; Mehra et al., 2006). Such TMT involvement in market information collection efforts may be in the form of customer visits, frequent and close customer interactions and/or informal meetings with customers

(e.g., lunches, dinners, golf games) (Bonner & Walker, 2004; Jaworski & Kohli, 1993; Slater & Mohr, 2006). Beyond increased innovativeness, such behavior is likely to lead to improved strategic decision-making, new strategic insights and courses of action and increased management confidence (Auh & Menguc, 2005; Menon, Bharadwaj, & Howell, 1996). Conversely, lack of access to tacit market information can limit effective decision-making and innovativeness (Brown & Ennew, 1995; Kuvaas, 2002; Zahay et al., 2004).

3. Model and hypotheses development

3.1. Model overview

The model is depicted in Fig. 1. TMTs and employees represent the two major actors in an organization that acquire market information, build market intelligence, and ultimately develop value-generating innovations. Hence, we first replicate past research, studying the effect of employees' market information collection efforts on firm innovativeness (H1). We then specify the main effect of TMT involvement in market information collection efforts on firm innovativeness, above and beyond employees' efforts (H2). Referring to the SPP framework, we next test the moderating effects of firm size (H3) and industry context (H4) on the relationship between TMT involvement in market information collection efforts and firm innovativeness. Finally, we examine the mediating effect of firm innovativeness on the relationship between TMT involvement in market information collection and business performance (H5).

3.2. Employees' market information collection efforts and firm innovativeness

Firm employees, often within the marketing department, are those typically responsible for market information collection efforts. Prior research has typically considered the standard approaches to market research conducted by specialized employees within the firm or by external market research companies. These approaches include customer surveys, focus groups and industry data analyses (e.g., Jaworski & Kohli, 1993; Li & Calantone, 1998; Moorman & Rust, 1999). This type of standard market-oriented behavior has been found to help firms respond better than their rivals to customers' current and future needs, and to identify and adapt to environmental trends more quickly (Atuahene-Gima, 1995; Jaworski & Kohli, 1993; Kirca et al., 2005). This, in turn often leads to improved innovation outcomes (Grinstein, 2008; Kirca et al., 2005).

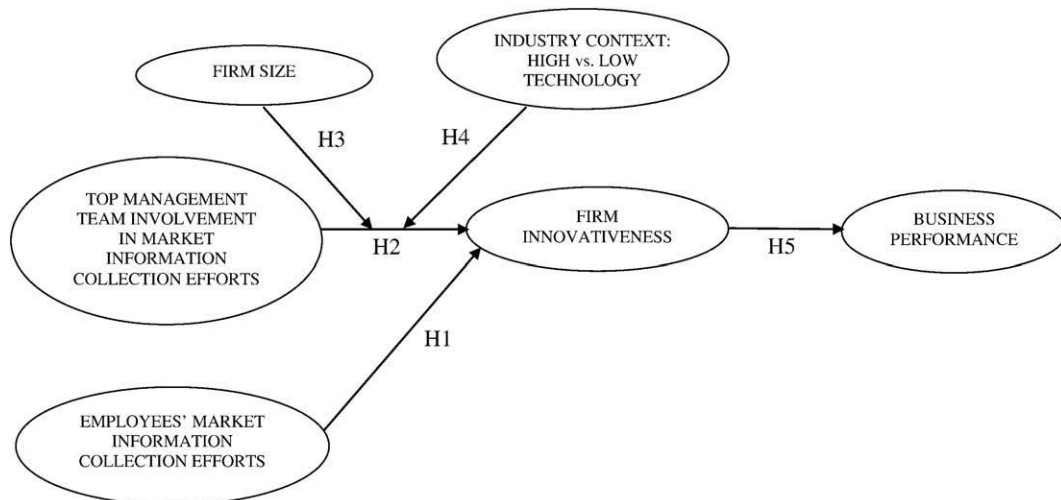


Fig. 1. The conceptual model.

Research also shows that interpersonal relationships between employees (e.g., key account managers, service personnel, R&D, marketing or salespeople) and customers help firms gain access to rich, tacit, and complex information, generating idiosyncratic market knowledge (Homburg & Stock, 2004; Jones, Busch, & Dacin, 2003). The reason is that close relationships with customers increase trust, emotional bonding, empathy and long-term commitment, all of which provide a good platform for information-sharing between individuals, which may be enhanced through frequent interaction (Bendapudi & Leone, 2002; Bonner & Walker, 2004). The availability of tacit information, in turn, is likely to increase firms' capacity to innovate (Bonner & Walker, 2004; Homburg & Stock, 2004). Based on the above, we suggest, as prior research has found, that employees' market information collection efforts are positively related to firm innovativeness:

**H1.** Employees' market information collection efforts are positively related to firm innovativeness.

### 3.3. TMT involvement in market information collection efforts and firm innovativeness

Prior research on TMTs generally suggests that top managers spend most of their valuable time on strategic rather than tactical tasks—for example, formulating the firm's growth strategies based on second-hand information rather than interacting with customers (Yadav et al., 2007). Nevertheless, such interactions, particularly those that are long-term, are critical drivers of organizational learning and the exchange of rich, tacit and rare information (Bonner & Walker, 2004). Furthermore, top managers are in a better position than are employees to build and nurture the trust and commitment of their customers because of their centrality in controlling organizational resources and their firm's strategic direction (Haytko, 2004; Mehra et al., 2006). Hence, top managers' close interactions with customers play a critical role in shaping firms' NPD direction and activities, and they result in increased innovation (Bonner & Walker, 2004; Jaworski & Kohli, 1993; Homburg & Stock, 2004). The market information that TMTs acquire from their customer relationships will help them identify future trends, latent customer needs and emerging business opportunities that can be incorporated into the NPD process (Cao et al., 2006; Collins & Clark, 2003).

Research on market orientation also suggests that since the TMT shapes the pattern of shared values and beliefs related to the functioning of the firm and provides individuals with norms for behavior (Auh & Menguc, 2005; Kohli & Jaworski, 1990), they, of all those in the firm, have the ultimate power to establish an organizational climate that fosters market information collection (Slater & Narver, 1995). Accordingly, organizations whose TMTs place great value on market information and maintain close ties with customers show a higher capacity to innovate (Jaworski & Kohli, 1993; Kirca et al., 2005). Therefore, we posit the following:

**H2.** TMT involvement in market information collection efforts is positively related to firm innovativeness.

### 3.4. TMT involvement and firm innovativeness: The moderating role of firm size

Firm size has often been studied as a moderator in marketing, organization and management research based on the agreement in these literatures that large firms differ from small firms in terms of many dimensions (Pelham & Wilson, 1996). Specifically, large and small firms have inherent differences in their access to external and internal networks of knowledge (Atuahene-Gima & Murray, 2007; Stam & Elfring, 2008) as well as in their organizational structures and resources (Pelham & Wilson, 1996).

Firm size is an important organizational factor that has stirred an ongoing debate in the innovation literature (Chandy & Tellis, 2000). While some studies suggest innovations to be more prevalent in larger firms, others posit that smaller firms are more innovative. On the one hand, innovation is viewed as a central strategy for small firms as they attempt to gain a competitive edge over larger firms because of the former's flexibility and adaptability (Knight & Cavusgil, 2004; Pelham, 1999). On the other hand, innovations may be more prevalent in larger firms due to resource availability. Also, large companies often serve more sizable customer accounts that demand more interaction with the TMT. Hence, the time investment by the TMT in hierarchically complex large firms may signal genuine interest in the customer and trigger more involvement from the customer. This, in turn, may be valuable in the sense that it provides novel ideas and innovative solutions (Auh & Menguc, 2005; Simons et al., 1999). This debate suggests that TMT involvement in market information collection can be beneficial for both large and small firms. However, as we discuss next, the incremental contribution of TMT involvement in market information collection for smaller firms is expected to be greater than that for large firms.

First, compared to large established corporations, smaller firms have limited resources, and this makes it more difficult to gain access to market information, i.e., to conduct professional market research or purchase industry data (Burke & Jarrat, 2004; Pelham & Wilson, 1996). This suggests that TMT involvement in generating market information may be invaluable for smaller firms because managers' external network resources can partially compensate for the lack of market information (Cao et al., 2006; Mehra et al., 2006).

Second, strong internal networks of knowledge are typically absent in small firms (Peng & Lou, 2000). Larger firms have a major advantage with regard to their internal knowledge base because of the sheer amount of their human capital, as well as because of the product portfolios, knowledge structures and technological priorities of their different business units. Hence, gaining access to external knowledge is more important for small firms. Such efforts by the TMT in small firms can compensate for their lack of a rich internal knowledge base by increasing access to external information (Peng & Lou, 2000; Stam & Elfring, 2008).

Finally, it is generally argued that top managers play a major role in shaping a firm's innovation goals, as well as in implementing them (Camelo-Ordaz et al., 2005; Elenkov et al., 2005). TMTs' impact on the NPD process, however, is expected to be much stronger in small firms. The reason is that these firms lack bureaucracy, have a flat organizational structure and a flexible culture, and are led by a small group of dominant managers (Knight & Cavusgil, 2004). Hence, TMT market-based insights into the NPD process in small firms will have a stronger impact than in large companies. We overall hypothesize that:

**H3.** The relationship between TMT involvement in market information collection efforts and firm innovativeness is stronger in small firms than in large ones.

### 3.5. TMT involvement and firm innovativeness: The moderating role of industry context

In this study, we examine two business environments: high-technology and low-technology industries (Grinstein, 2008; Kirca et al., 2005). Mohr, Sengupta, and Slater (2005) differentiate between high- and low-technology industries based on the *market uncertainty* that customers face in making adoption decisions regarding new technologies and products, the *technological uncertainty* related to the future performance of products and/or companies, and *competitive volatility* arising from new entrants and their frequent new offerings. Although any of these forces (e.g., competitive volatility) may be present to some extent in low-technology industries, the high-technology industry context is generally characterized by the "intersection" of all three dynamics.

Recently, innovation has been acknowledged as the key differentiation mechanism for all firms. Like high-technology firms, low-technology firms are required to innovate to ensure their survival and growth (Grinstein & Goldman, 2006). The question of whether the use of market information and the adoption of customer-centric behavior are beneficial for low- versus high-technology firms remains unaddressed. One view suggests that R&D efforts (as opposed to customer intelligence) are the major drivers of innovation in technologically turbulent environments (Gatignon & Xuereb, 1997; Grinstein, 2008). Moreover, some studies argue that customer-oriented behavior leads to less innovative products and solutions because customers are capable of expressing their current consumption experiences but are often not able to articulate their latent needs beyond (Christensen, 1997; Im & Workman, 2004; Lukas & Ferrell, 2000). This suggests that the contribution of market information to competitive advantage in low-technology industries will be more pronounced (Deshpandé & Farley, 2004).

However, gathering market information may be more critical in high-technology environments than in low-technology industries due to frequent changes in customer expectations, rapid technological shifts, the availability of more information resources and shorter product life cycles (Henard & Szymanski, 2001; Nelson, 1993). Market uncertainty and intense rivalry in high-technology industry contexts arise from difficulties in foreseeing customer expectations associated with new products and the commercialization of new technologies; they reduce firms' ability to estimate the size and development of the market. This suggests that high-technology firms need advanced organizational mechanisms for market information collection and make frequent and substantial investments to stay ahead of their markets. Furthermore, technological advancements constitute opportunities for firms that, if exploited, enhance their ability to convert customer insights into new product ideas (Bonner & Walker, 2004; Sorescu & Spanjol, 2008). Since innovations are driven by both state-of-the-art technologies and customer needs (expressed and latent), the key to innovativeness is to match what is needed and what can be developed internally (Li & Calantone, 1998). Due to the challenges and opportunities that arise in turbulent market environments, top managers at high-technology firms may be more motivated and accustomed to attaining this match and thus contributing more to the flow of novel insights into NPD processes than are those at low-technology companies. We overall hypothesize that:

**H4.** The relationship between TMT involvement in market information collection efforts and firm innovativeness is stronger in high-technology industries than in low-technology ones.

### 3.6. TMT involvement and business performance: The mediating role of firm innovativeness

Beyond the effect of TMT involvement in market information collection efforts on firm innovativeness, one can consider two possible routes to improved performance: (1) a direct effect of TMT involvement in market information collection efforts; and (2) an indirect effect, one mediated by firm innovativeness. We suggest that the performance returns from TMT involvement in market information collection accrue both directly and indirectly through firms' proficiency in utilizing their market information in unique ways (i.e., firm innovativeness). This line of reasoning is grounded in the SPP framework, which suggests that firms' unique organizational resources (e.g., market information) are converted into superior performance outcomes through resource utilization and implementation (Day & Wensley, 1988). The attainment of competitive advantage in the market rests upon the firms' proficiency in utilizing their distinctive capabilities to cultivate superior resources (Im & Workman, 2004; Song & Parry, 1997).

TMT commitment to customer interactions and market information collection may provide direct benefits to the firm, such as customer

loyalty. We also argue that the effect of TMT involvement in market information collection on business performance may be indirect, occurring through firm innovativeness. To state it differently, firm innovativeness can be interpreted as a 'mediating event' that fosters the relationship between TMT involvement in market information collection efforts and competitive advantage in the marketplace (c.f., Elenkov et al., 2005; Jehn et al., 1999). Prior marketing and innovation research suggests that firms possessing superior resources and capabilities, such as the capacity to innovate, should gain sustainable competitive advantage (Hunt & Morgan, 1995; Li & Calantone, 1998). A firm that continuously creates superior, unique and novel products should enjoy positional advantages in the market and achieve superior performance (Gatignon & Xuereb, 1997; Moorman, 1995). Furthermore, as we suggested earlier, a positive relationship between TMT involvement in market information collection efforts and firm innovativeness is expected. Relevant market information can be utilized in more adept decision-making in NPD (Song & Parry, 1997). TMTs' access to information regarding customer expectations and competitive strategies may bring about opportunities for firms to improve their own products (Im & Workman, 2004). Accordingly, by enhancing firm innovativeness, TMT involvement in market information collection can contribute to market success. Thus, we overall hypothesize the following:

**H5.** The effect of TMT involvement in market information collection efforts on business performance is mediated by firm innovativeness.

## 4. Methods

### 4.1. Sample and data collection

The empirical research designed to test our model was conducted in Israel. The sample consisted of 97 business-to-business (B2B) firms. B2B is a relevant context because in these firms, customer information plays an important role in achieving market success (Calantone & Di Benedetto, 1988). As in other similar studies (e.g., Gatignon & Xuereb, 1997; Hult & Ketchen, 2001), we sampled both firms and strategic business units (SBUs) but asked respondents in multi-SBU firms to focus on the most central SBU. To recruit interviewees, we employed facilitators (academic researchers, consultants, government officials, and executives). The facilitators were asked to record all the B2B firms they were familiar with from a list of Israeli B2B firms obtained from a local research company and identify the firms that would be ready to cooperate in the study. The facilitators selected 159 firms from a wide range of industries and suggested one executive in each firm who should be targeted. We first contacted these executives via telephone and email, sending each a letter describing the study purpose and potential contributions. Initially, 77 firms agreed to participate. Follow-up phone calls and emails generated 20 additional firms. Overall, of the 159 firms contacted, 97 (64%) participated in the study. Our sampled firms resemble the typical Israeli firm in terms of key variables such as size (about 60% of our sampled firms employ fewer than 100 employees) and industry (34% of our sample are high-technology firms) (Manufacturers Association of Israel, 2007).

We used a questionnaire as our primary data collection tool. It was initially pre-tested with the facilitators. We then conducted a pilot study involving executives from 10 firms. We used face-to-face interviews rather than a mail survey (as commonly used in similar marketing studies—e.g., Gatignon & Xuereb, 1997; Jaworski & Kohli, 1993). This technique increases response rates and generates more valid information. One executive was interviewed for each company; this is a common practice in marketing research (c.f., Gatignon & Xuereb, 1997). The main reason is that top managers are notoriously difficult to get to participate in research studies (Yadav et al., 2007).

The sample included manufacturing and service companies (44.3% and 55.7%, respectively), as well as firms of different ages

( $M = 22.9$  years,  $SD = 20.1$ ), sizes ( $M = 613.4$  employees,  $SD = 1602.3$ ), sales levels ( $M = 106.2$  million US\$,  $SD = 217.7$ ) and ownership types (non-publicly traded companies comprised 78.4% of the sample). Interviewees included CEOs/presidents (44.3%), VPs (40.2%) and mid-level managers (15.5%). Their areas of responsibility covered general management (60.9%), marketing (24.7%), sales (7.2%), operations (4.1%), R&D (2.1%) and finance (1.0%). In the majority of cases, interviewing involved a single session of approximately 1 h.

#### 4.2. Measures

All scale items are shown in Appendix A. Our measures consist of items adapted from the existing literature as well as very few that were developed for the purposes of this study. All items comprised 5-point scales from “strongly disagree” to “strongly agree” (except for firm size and industry context).

To assess *TMT involvement in market information collection efforts*, we employed two modified items from Narver and Slater (1990) and Wathne, Biong, and Heide (2001); we also developed one new item. To measure *employees' market information collection efforts*, we modified four items from studies by Jaworski and Kohli (1993), Narver and Slater (1990), Nielson (1998) and Slater and Mohr (2006). This measure reflects explicit efforts by employees (e.g., informal relationships) as well as the key information collection techniques they typically utilize or are responsible for utilizing (e.g., conducting customer surveys).

*Firm innovativeness* was measured using two items from Homburg and Stock (2004), two items from Atuahene-Gima (2005) and one new item. We assessed *business performance* using two objective measures. Specifically, we obtained the percentage of sales and profit growth of the companies in our sample over the past three years (c.f., Morgan & Rego, 2006; Rose & Shoham, 2002).

We measured *firm size* using the number of employees based on a 6-point scale (e.g., Bradley & Gannon, 2000). The scale range was 1 = 1–50 employees; 2 = 51–100 employees; 3 = 101–250 employees; 4 = 251–500 employees; 5 = 501–750; and 6 = more than 750 employees. To assess *industry context*, we coded 0 for low-technology firms and 1 for high-technology firms based on a classification from the Israeli Central Bureau of Statistics.<sup>2</sup>

#### 4.3. Measurement model validation

Multi-item scales employed to measure the constructs were validated according to standard procedures (Anderson & Gerbing, 1988; Baumgartner & Homburg, 1996; Churchill, 1979). The adequacy of the measurement model was tested by examining: (1) the unidimensionality of the constructs, (2) scale reliabilities, and (3) convergent and discriminant validity. Principle component analysis with varimax rotation was first performed to assess the unidimensionality of each construct, yielding four distinct factors with each representing one of the constructs and together explaining 63.4% of the variance. Only the first eigenvalue was greater than one; this supported the constructs' unidimensionality (Gerbing & Anderson, 1988).

To validate our measurement model, we first performed a confirmatory factor analysis (CFA) using maximum likelihood EQS version 6.1 (Bentler, 1995). The model was satisfactory:  $\chi^2 = 134.58$ ,  $df = 85$ ,  $p < 0.01$ ; NNFI = 0.930; and CFI = 0.944. The scale reliability of the measures was assessed using internal composite reliabilities (ICR)<sup>3</sup> and Cronbach's alphas (Fornell & Larcker, 1981). Based on ICR and Cronbach's alpha measures, all scales demonstrate adequate internal

consistency. Convergent validities were evaluated by calculating average variance extracted (AVE) and examining the loadings of the items on their corresponding factors (Fornell & Larcker, 1981). The reported AVEs were acceptable (at least 0.50), showing support for substantial explained variance for each dependent variable. The analysis of the measurement model revealed high loadings for all scales and provided support for convergent validity (see Appendix A; Bagozzi, Yi, & Phillips, 1991; Fornell & Bookstein, 1982).

At the construct level, discriminant validity was evaluated by testing whether the AVE for each construct (the average variance shared between a construct and its measures) was greater than the shared variance between the construct and other constructs in the model (square of the correlation between the two constructs) (Fornell & Larcker, 1981; Hulland, 1999). The AVEs of the constructs were all higher than their shared variances, and thus all constructs in the model exhibited discriminant validity. Discriminant validity at the item level was shown by the lack of significant cross loadings as indicated by a Lagrangian multiplier test (LM) (Bagozzi, Yi, & Phillips, 1991). Moreover, a model with construct correlations constrained to 1.00 was compared to an unconstrained model. This led to a significant increase in chi-square, and LM-tests revealed that these constraints should be removed. Thus, all constructs exhibited discriminant validity. Table 1a provides the bivariate correlations among all model constructs, and Table 1b depicts the average within- and between-construct item-to-item correlations.

Common method bias was addressed using three techniques based on the guidelines of Podsakoff, MacKenzie, Lee, and Podsakoff (2003) and Netemeyer, Boles, McKee, and McMurrian (1997): (1) Harman's one-factor test using all constructs, (2) Harman's one-factor test using pairs of independent and dependent variables, and (3) the comparison of a model with all construct indicators also loading to a 'same-source' factor (i.e., single common-method factor) to a constrained model in which these loadings were set to zero. All three techniques indicate that there is no common method bias problem in our data. In addition, the fact that our ultimate dependent variable (i.e., firm performance) involves objective measures further minimizes concerns about common method bias.

## 5. Results

### 5.1. Analysis

The proposed model was examined using multiple regression analysis and ordinary least squares (OLS) estimation.<sup>4</sup> The measurement items were averaged for the multi-item constructs. The moderating effects of firm size and industry context were modeled as mean-centered interactions to reduce multicollinearity (Aiken & West, 1991; Jaccard, Turrisi, & Wan, 1990). When an interaction effect is statistically significant, it is interpreted as a conditional effect on the main effects (Jaccard et al., 1990); i.e., the path coefficients represent the conditional impact of one effect when the other effect is at its mean (or some other level). The results for the hypothesized model are presented in Table 2 (variance explained for each dependent construct and path coefficients for the hypotheses along with their significance levels). The variance explained (adjusted  $R^2$  values) for the main effects model and the interaction model were 0.37 and 0.43, respectively. To test whether the specification of the interaction terms significantly contributed to explained variance, we compared the two models based on an  $F$  test of differences (Cohen & Cohen, 1983). The  $R^2$  increment of the interaction effects model over the main effects model was significantly different from zero ( $p < 0.01$ ).

Our results indicate that employees' market information collection efforts positively influence firm innovativeness ( $\beta = 0.363$ ,  $p < 0.01$ ).

<sup>4</sup> Because of our relatively small sample, we ran the analysis with PLS as well, as appropriate for smaller samples, and got similar results.

<sup>2</sup> [http://www.cbs.gov.il/www/publications/hitech/hi\\_class\\_heb.pdf](http://www.cbs.gov.il/www/publications/hitech/hi_class_heb.pdf).

<sup>3</sup> ICR represents a ratio consisting of the squared total of the variance explained for each manifest variable divided by the sum of the squared total of the variance explained plus the total of the unexplained variance. An ICR greater than 0.7 is considered adequate to achieve sufficient reliability.

**Table 1a**  
Correlations among constructs.

	Mean	1	2	3	4	5	6
1 TMT involvement in market information collection efforts	3.93	1.20					
2 Employees' market information collection efforts	3.77	0.525 <sup>a</sup>	1.18				
3 Firm innovativeness	3.84	0.540 <sup>a</sup>	0.549 <sup>a</sup>	1.09			
4 Business performance	12.63	0.00	0.02	0.230 <sup>b</sup>	24.06		
5 Firm size	2.75	-0.02	-0.06	-0.10	-0.03	1.90	
6 Industry context (high versus low-technology)	n.a.	0.03	0.07	0.02	-0.09	-0.07	n.a.

NOTE: Variances on the diagonal. Correlations are from the CFA's phi matrix. n.a. = non-applicable.

<sup>a</sup> Indicates that the correlation is significant at 0.01 alpha level.

<sup>b</sup> Indicates significance at 0.05 alpha level.

**Table 1b**  
Average within- and between-construct item-to-item correlations.

	1	2	3	4	5	6
1 TMT involvement in market information collection efforts	0.38					
2 Employees' market information collection efforts	0.29	0.38				
3 Firm innovativeness	0.31	0.30	0.45			
4 Business performance	0.00	0.03	0.15	0.39		
5 Firm size	0.08	0.24	0.10	-0.13	1.00	
6 Industry context (high versus low-technology)	0.03	0.04	0.01	-0.06	-0.02	1.00

Hence, H1 is supported. Furthermore, TMT involvement in market information collection efforts exerts a strong positive influence on firm innovativeness ( $\beta = 0.349, p < 0.01$ ) above and beyond employees' efforts, as predicted in H2. As expected in H3, the interaction effect between TMT involvement and firm size on firm innovativeness is negative ( $\beta = -0.154, p < 0.05$ ), suggesting the effect of TMT involvement to be stronger for small firms than for large ones. TMT involvement in market information collection combined with industry context exerts a significant positive effect on firm innovativeness ( $\beta = 0.246, p < 0.01$ ), providing support for H4. This result indicates that the effect of TMT involvement is stronger for high-technology firms than for low-technology ones.

We further examined the details of these interaction effects following Aiken and West's (1991) guidelines. Regression slope coefficients were estimated (1) at high (one standard deviation above) and low (one standard deviation below) levels of firm size, as well as (2) for high-technology versus low-technology contexts (when industry context equals 1 versus 0). In small firms, the effect of TMT involvement on firm innovativeness was positive and significant at the 1% level ( $\beta = 0.331, t = 2.85$ ), whereas in large firms it was non-significant ( $\beta = 0.167, n.s.$ ). The strength of this relationship was more positive in the high- than in the low-technology industry contexts ( $\beta = 0.443, t = 2.75$  and  $\beta = 0.367, t = 4.10$ , respectively). These results are reported in Fig. 2A and B.

**Table 2**  
Fit statistics and path coefficients.

	Direct effects				Collinearity diagnostics	
	Firm innovativeness (R-square = 0.40; adjusted R-square = 0.37)		Business performance (R-squared = 0.06; adjusted R-square = 0.04)		Tolerance	VIF
	Estimate	t-value	Estimate	t-value		
TMT involvement in market information collection efforts	0.349 <sup>a</sup>	3.66			0.724	1.381
Employees' market information collection efforts	0.363 <sup>a</sup>	3.80			0.720	1.390
Firm size	-0.079	-0.97			0.992	1.008
High versus low-technology dummy	-0.019	-0.23			0.991	1.009
	Firm innovativeness (R-square = 0.46; adjusted R-square = 0.43)				Tolerance	VIF
TMT involvement in market information collection efforts	0.233 <sup>b</sup>	2.27			0.567	1.764
Employees' market information collection efforts	0.338 <sup>a</sup>	3.70			0.713	1.402
Firm size	-0.045	-0.57			0.957	1.045
TMT involvement in market information collection efforts * firm size	-0.154 <sup>b</sup>	-1.96			0.991	1.009
High versus low-technology dummy	-0.025	-0.32			0.959	1.043
TMT involvement in market information collection efforts * high versus low-technology dummy	0.246 <sup>a</sup>	2.63			0.683	1.464
Firm innovativeness			0.230 <sup>b</sup>	2.31		

<sup>a</sup> Indicates that the relationship is significant at 0.01 alpha level.

<sup>b</sup> Indicates significance at 0.05 alpha level.

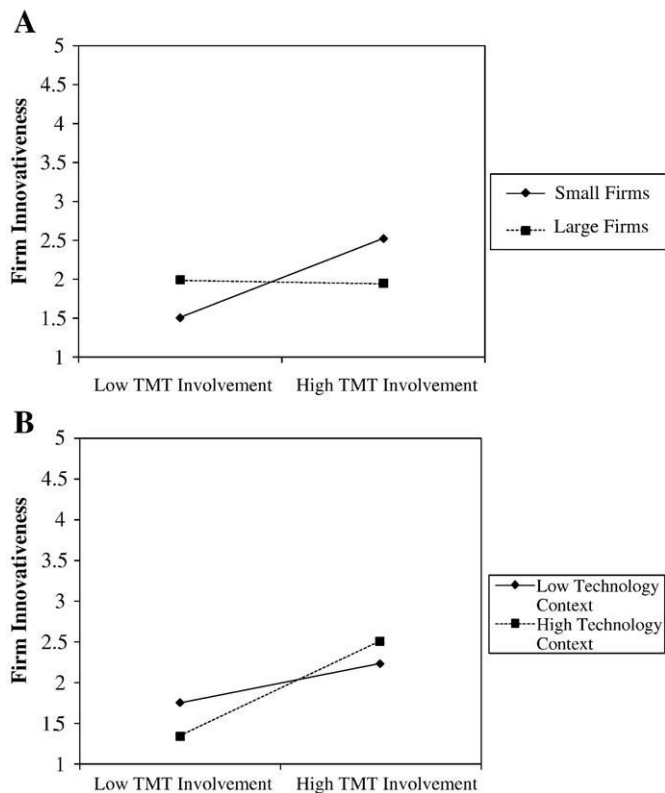


Fig. 2. A. Interaction effect of TMT involvement and firm size on firm innovativeness. B. Interaction effect of TMT involvement and industry context on firm innovativeness.

To assess the mediation effects of firm innovativeness, we referred to Baron and Kenny's (1986) definition of mediation (p. 1176). As we mentioned earlier, TMT involvement in market information collection was significantly and positively related to firm innovativeness, and hence, Baron and Kenny's (1986) first condition was satisfied. Firm innovativeness was positively and significantly related to business performance ( $\beta = 0.230$ ,  $p < 0.05$ ), providing support for the second condition. Finally, we found that TMT involvement does not exert direct effects on business performance ( $\beta = -0.147$ , n.s.) after controlling for *firm innovativeness simultaneously*, providing support for the third one of Baron and Kenny's conditions and exhibiting the existence of *complete* mediation. This suggests that there would be no direct effect of TMT involvement in market information collection on business performance (given the other paths in the model). Furthermore, referring to Bollen's (1989) operational definition of indirect effects and the significance test proposed by Baron and Kenny (1986)<sup>5</sup>, we calibrated the indirect effect of TMT involvement in market information collection on business performance along with its critical ratio. Parallel to our expectations in H5, we found TMT involvement to exert a positive and significant indirect effect on business performance through firm innovativeness ( $\beta = 0.080$ ,  $t = 1.962$ ,  $p < 0.05$ ).

<sup>5</sup> To estimate and test the significance of the indirect effects, we used the following procedure (Baron & Kenny, 1986; Bollen, 1989; Sarkar, Echambadi, Cavusgil, & Aulakh, 2001): Assume that  $a$  and  $b$  are path coefficients for the direct effects of  $X_1 \rightarrow X_2$  and  $X_2 \rightarrow X_3$ , and that  $SE_a$  and  $SE_b$  are the standard errors, respectively. The indirect effect of  $X_1$  on  $X_3$  is the product of path coefficients  $a$  and  $b$ . The standard error for the indirect effect,  $ab$ , is calculated as:  $SE_{ab} = \text{sqrt} [(b^2 SE_a^2 + a^2 SE_b^2 + SE_a^2 \cdot SE_b^2)]$ .

## 6. Discussion and implications

The argument that market information, particularly information collection, plays a crucial role in determining firm success is widely accepted (Deeter-Schmelz & Ramsey, 2003; Moorman, 1995). However, one important aspect of market information collection is yet to be fully studied: the contribution of the involvement of the TMT, within the context of market information collection efforts, to firm innovativeness and performance.

Our key finding is that TMT involvement in market information collection contributes to firm innovativeness above and beyond the collection efforts made by employees. While prior research on top managers suggests that they are often not active participants in the collection of market information (e.g., Liu & Comer, 2007; Zahay et al., 2004), we demonstrate that TMT involvement in market information collection creates value for the firm and augments business performance through increased innovativeness. We proposed that TMTs can enhance firm innovativeness because they play a key role in shaping the strategic direction of the organization, especially its NPD activities (Auh & Menguc, 2005; Sinkula et al., 1997). We find support for our hypothesis. Top managers who are highly involved in market information collection efforts and stay close to their customers are getting 'a good sense' of the market. They are more likely to be exposed to tacit market information and thus, when making strategic decisions concerning NPD initiatives, they are more likely to incorporate these important pieces of information. This, in turn, significantly contributes to firms' innovation processes and outcomes. Our finding also provides support for the ability of the TMT to send signals to organizational members about the value of market information collection efforts. To be able to establish the corporate culture they envision, managers need to communicate their vision to employees (Yadav et al., 2007). In the specific case of building and nurturing a market-oriented culture, the TMT's "hands on" market information collection efforts are likely to be an important signal to organizational members. There may be a number of mechanisms through which a TMT communicates these signals (e.g., formally versus informally), and innovations ultimately emerge from their involvement in market information collection. Managers can consider systematically sharing insightful market information with other top managers, department heads and employees both formally through progress reports and brainstorming meetings and informally through interpersonal interactions. An alternative approach the TMT could adopt would be to invite customers with valuable insights to visit the firm, encouraging cooperation through presentations and meetings.

Our results also exhibit that TMT involvement in market information collection enhances business performance only through increased firm innovativeness. This finding indicates that managers who maintain effective ties with customers can provide opportunities for the development of new product ideas with superior benefits; however, these effects may contribute to firm growth in sales and profitability *only after* they result in higher levels of innovativeness (c.f., Collins & Clark, 2003). This finding supports recent upper echelons research that claims that TMTs' characteristics or behaviors do not directly influence firm performance (e.g., Camelo-Ordaz et al., 2005; Elenkov et al., 2005; Jehn et al., 1999). Furthermore, as Day and Wensley's (1988) SPP framework suggests, the effects of TMT involvement in market information collection can only be converted into superior performance through the firm's proficiency in utilizing its market information in unique ways (i.e., firm innovativeness; Im & Workman, 2004; Song & Parry, 1997).

There are two important points related to this result. First, while this study finds a positive impact of firm capacity to innovate on business performance, we do not differentiate between the types of innovations (i.e., radical versus incremental). This distinction may be relevant in explaining the variation in firm performance, as prior innovation research suggests (Sorescu & Spanjol, 2008). Second, it is



noteworthy that while firm innovativeness is found to be an important mediator of the relationship between TMT involvement in market information collection and firm performance, there may be other potential mediators not studied here that deserve attention. For example, strong and close ties of top managers with customers may lead to enhanced customer satisfaction and loyalty, which in turn can engender superior firm performance (Homburg & Stock, 2004; Kirca et al., 2005).

Referring to the SPP framework, we also examined the moderating effects of two important firm- and industry-related variables: firm size and industry context. We hypothesized that the effects of TMT involvement in market information collection efforts contribute more strongly to firm innovativeness in small firms than in large ones. Our results confirm our expectations and indicate that as firm size increases, the influence of TMT involvement on firm innovativeness diminishes. Put differently, higher marginal innovation returns accrued from TMT involvement for small firms than for large firms. This finding contributes to the debate on the relationship between firm size and innovativeness (e.g., Chandy & Tellis, 2000). We suggest three possible underlying explanations. First, small firms have scarce resources with which to acquire market information. Hence, TMT involvement in market information collection compensate for this weakness. Second, compared to large companies, small firms have limited strong internal networks of market intelligence; hence, they need access to external sources of market information. Finally, since small firms are often centralized and led by a very few dominant top managers, managers' influence on the shaping and implementation of a firm's innovation goals may be much stronger in small firms. A possible implication for TMTs in large firms might be the need to establish a team with more managerial discretion (Hambrick, 2007) that would enable top executives to retain their influence on organizational members and on the firm's strategy and performance.

We also expected the relationship between TMT involvement and firm innovativeness to be stronger in high-technology firms than in low-technology firms. We found support for our hypothesis. This finding contributes to the debate in the marketing literature over the innovation benefits that firms derive from customer-driven behavior in technologically turbulent environments (e.g., Gatignon & Xuereb, 1997; Im & Workman, 2004). Specifically, we contend that due to market and technological uncertainties, external market information is more critical in high-technology environments than in low-technology ones. While market uncertainty and rivalry may hinder firms' ability to forecast customer demand, technological turbulence may offer opportunities to develop and commercialize next-generation products with superior benefits. By shaping the organizational culture around innovation and providing the necessary market knowledge, TMT involvement in market information collection allows firms to overcome challenges and exploit market opportunities.

Our study provides a number of managerial implications. The first relates to TMT governance and strategic decision-making processes. We show that firms benefit from the involvement of TMT in market knowledge creation. TMTs' contribution to returns from market information collection is stronger for small firms (than for large firms) and for high-technology firms (than for low-technology firms). This indicates that TMTs are a sentinel for the 'challenged': their involvement in market information collection compensates for the limited resources associated with SMEs and allows high-technology firms to cope effectively with changing market dynamics. Overall, this indicates the importance of studying TMTs' role in decision-making both at the strategic and the tactical, day-to-day level. Another implication is the need for firms to develop and nurture channels that allow managers and employees to stay close to their customers and build enduring relationships. This requires the allocation of organizational resources and the development of appropriate human resources practices such as training (Collins & Clark, 2003). In addition, while we show the benefits that firms reap from TMT

involvement in market information collection, there may be circumstances in which such involvement becomes sub-optimal. Our results, particularly in large firms, may suggest that the returns from TMT involvement in bureaucratic institutions and/or formal organizational processes may actually be unfavorable for the firm. Managers therefore may need to delicately balance the nature, timing and intensity of their involvement, matching them appropriately with the demands of their firm's internal and external environment. Finally, due to top managers' intense job demands and stress, managers should carefully balance the attention they allocate to customers and to other important stakeholders. Hence, we demonstrate that not only market information but also the actors who collect that information (i.e., the TMT) are essential to competitive advantage.

## 7. Limitations and future research directions

Several limitations should be pointed out. Some may signify future research opportunities. First, we study a central market information source: customers. However, other market information sources such as competitors, suppliers, distributors, government agencies and other stakeholders (Kohli & Jaworski, 1990) are important and are likely to affect managerial and employee decision-making as well as organizational outcomes. Future research should incorporate these additional market information sources. Within the realm of customer information, it may also be interesting to examine the effects of market information generated from different customer types: short-versus long-term customers, domestic versus international customers, etc.

Second, most of our measurements were perceptual, and some were based on relatively few items; they were all collected from single respondents from each firm. This is a limitation of our study, which often characterizes research aimed at surveying top managers, as these are notoriously difficult to reach. Still, we made an effort to minimize this limitation by collecting objective data on our sampled firms' performance, by conducting face-to-face interviews rather than sending a survey to managers and by conducting multiple tests to make sure that common method bias is not a problem.

Third, our results indicate that the importance of the contributions of the TMT to market information collection is especially relevant in B2B environments where close and long-term relationships characterize many business interactions (Bendapudi & Leone, 2002; Lian & Laing, 2007). On this basis, a relevant future research area relates to the comparison of B2B and business-to-consumers (B2C) contexts, examining the consistency of the findings across the different types of customers.

Fourth, in this study we examined only two key firm- and industry-related moderators: firm size and industry context. The explained variation in our business performance construct is low, signaling that other potential factors may be at play. Furthermore, it is logical to assume that the effectiveness (and hence the benefits to firms) associated with using different mechanisms to attain superior innovativeness and performance vary in accordance with other firm and market conditions. Future research might examine the moderating effects of other organizational and environmental variables (e.g., type of customer, market turbulence).

Finally, an important aspect of market information collection involves the study of informal and interpersonal relationships, an under-researched area in marketing that deserves further study (Grayson, 2007; Slater & Mohr, 2006). A relevant future research effort may involve a detailed comparison of different informal market information collection methods, such as the use of customer visits and professional friendships. Furthermore, researchers may study the role of friendship versus utility maximization in business relationships and top managers' behavior in these contexts (Grayson, 2007; Heide & Wathne, 2006). A qualitative research approach would be valuable here (Kotter, 1999). It may also be helpful to differentiate between two types of TMT

involvement in market information collection efforts: informal and formal. Our measure of TMT involvement captures both dimensions. This distinction, however, may shed more light on the impact that TMTs have on organization members and on members' informal versus formal market information collection efforts.

## Appendix A. The measures

The constructs and items	The source	Loadings	Properties of the measures
<i>TMT involvement in market information collection efforts</i>			
Our top managers from each business function regularly visit customers	Narver and Slater (1990)	( $\lambda = 0.64$ )	ICR = 0.81; $\alpha = 0.65$ ; AVE = 0.59
Our top managers receive information on customers on a regular basis	Wathne et al. (2001)	( $\lambda = 0.79$ )	
The top management team works closely with customers to identify their current and future needs	New item	( $\lambda = 0.86$ )	
<i>Employees' market information collection efforts</i>			
We poll end-users at least once a year to assess the quality of our products and services	Jaworski and Kohli (1993)	( $\lambda = 0.69$ )	ICR = 0.82; $\alpha = 0.71$ ; AVE = 0.54
We frequently measure customer satisfaction	Narver and Slater (1990)	( $\lambda = 0.74$ )	
Our business unit periodically circulates documents (e.g., reports, newsletters) that provide information on our customers	Jaworski and Kohli (1993)	( $\lambda = 0.81$ )	
In our business unit sales and service people interact with customers to gather information from them	Nielson, 1998; Slater and Mohr, 2006; Jaworski and Kohli, 1993	( $\lambda = 0.68$ )	
<i>Firm innovativeness</i>			
Our product/service offer is continuously updated with new products or services	Homburg and Stock (2004)	( $\lambda = 0.70$ )	ICR = 0.86; $\alpha = 0.80$ ; AVE = 0.56
Our products/services are subject to permanent innovations	Homburg and Stock (2004)	( $\lambda = 0.64$ )	
We continuously improve the attributes of the firm's products	Atuahene-Gima (2005)	( $\lambda = 0.76$ )	
We emphasize our innovations in our marketing communication	New item	( $\lambda = 0.81$ )	
Almost every year we launch new products/services that are based on new technologies	Atuahene-Gima (2005)	( $\lambda = 0.81$ )	
<i>Business performance</i>			
Growth in sales	Morgan and Rego, 2006;	( $\lambda = 0.78$ )	ICR = 0.81;
Growth in profits	Rose and Shoham, 2002	( $\lambda = 0.49$ )	$\alpha = 0.55$ ; AVE = 0.68

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