Market orientation's boundary-spanning role to support innovation in SMEs

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Introduction

The presence of market orientation (MO) encourages firms to gather information from their customers, internally coordinating and facilitating actions to adjust to customer needs (Kohli and Jaworski, 1990; Narver and Slater, 1990). According to Grinstein (2008), marketing researchers consider MO to be the most important strategic orientation for firms in adapting to their environment and contributing to business success. Generally, results show that MO enables improvements in business performance and that these results occur when corporate culture, internal conditions and capabilities combine to provide for MO development (Zhou, Yim and Tse, 2005). Blankson, Motwani and Levenburg (2006), note that despite the attention given to MO by researchers, small and medium-sized enterprise (SME) specific research has been limited. To appreciate, understand and practice MO also represents a challenge for many SMEs (Pelham and Wilson, 1996; Blankson and Stokes, 2002; Blankson et al. 2006), with doubts as to its relevance for their business compounding this challenge (Harris and Watkins, 1998).

A premise of this paper is that the relationship between MO and innovation is critical to developing the literature on MO in SMEs, as well as furthering an understanding of its relevance to their innovation success (defined by Baker and Sinkula 2009 as innovations by which firms maintain and expand consumer and product markets). Researchers view the relationship between MO and innovation in SMEs, while under-researched, as potentially significant (Verhees and Meulenberg, 2004). Salavou, Baltas and Lioukas (2004), note that SME research has tended to focus on the impact of firm-specific characteristics on innovation (e.g. Laforet and Tann, 2006; Bigliardi, Colacino and Dormio, 2011; Dibrell et al. 2011), with less attention being given to the effects of strategic orientations such as MO. Notwithstanding, MO may play

an important role in supporting innovation that can positively contribute to performance (Salavou et al. 2004; Dibrell, Craig and Hansen, 2011). Previous studies point to a progressive relationship between MO and innovation, identifying innovativeness for example as important (Hurley and Hult, 1998) and particularly the innovativeness of owner/managers in SMEs (Verhees and Meulenberg, 2004). Recent research by Baker and Sinkula (2009) and Hashi and Stojcic (2013), found that as a firm's MO increases then the likelihood that it would decide to innovate and the success of that innovation also increases. Baker and Sinkula (2009) also note that the limited resources and market power of smaller firms provides a challenge to them in achieving innovation success.

The aim of this study is to address existing literature gaps and add new insights by examining the relationship between MO, external sources of innovation and intra-firm mechanisms to support innovation. Research points to the positive influence made by sources of innovation for firms as a means of meeting market demands (Cavusgil, Calantone and Zhao, 2003; Chen, Damanpour and Reilly, 2010; Laforet and Tann, 2006). Sources of innovation are particularly relevant for SMEs given resource constraints, including supply chain links (e.g. upstream and downstream) and other external sources (e.g. universities and research institutes, trade fairs, government bodies). We also focus attention on the intra-firm mechanisms for innovation, including human resource development (HRD) practices and the use of systems and technology. To address the research aim, a survey was conducted with 325 SMEs from the district of Antofagasta in northern Chile.

Broadly speaking, the relationship between MO and innovation is shown to be critical to understanding of the role of MO in SMEs, as well as furthering an understanding of MO's relevance to innovation success. More specifically the empirical study findings contribute new

insights into the relationship between MO, sources of innovation (supply chain links and other external sources) and intra-firm mechanisms (HRD and technology) to support innovation in SMEs. The study reveals that MO significantly affects sources of innovation, providing a market-centric focus for SMEs in drawing them down in the development of new products and services. It also reveals that sources of innovation positively affect intra-firm mechanisms for innovation. Finally, the study reveals that MO has an indirect and positive effect on intra-firm mechanisms for innovation via the extent to which the studied SMEs use different sources of innovation; market-oriented SMEs seeking sources of innovation require effective firm-level mechanisms to exploit them through market-focused innovations. To better understand these relationships we consider MO's boundary-spanning role for SMEs. We move beyond a typical focus on owner/managers and their personal characteristics to focus on MO as the 'linking pin' between SMEs' internal and external environment in supporting market-focused innovation. Boundary spanning defined by the level of MO present in the SMEs studied represents what Bergenholtz (2011) terms a knowledge broker, integrating sources of innovation and intra-firm mechanisms around new product and service development *that is relevant* to customer needs. Hult (2011) asserts that now more than ever, marketing is assuming a key boundary-spanning role – a role that he believes is also redefining the composition of the organization. For SMEs in particular this has particular relevance given inherent resource constraints, with MO's boundary spanning role in ensuring innovation success key to maintaining their competitive position and equilibrium (see for e.g. Stock and Zacharias, 2011).

In the next section the theoretical background and study hypotheses are developed, followed by the methodology used. Subsequently, the analysis and discussion of results is presented. Finally, managerial implications, study limitations and future research directions are explicated.

Theoretical Background

The marketing literature considers MO as the extent to which an organization's analysis of the external marketing environment influences the strategic planning process including the acquisition and allocation of resources (Baker and Sinkula, 2002). Narver and Slater (1990) focus on three behavioral components of MO: customer orientation; competitor orientation; and, inter-functional coordination. They reside within an organizational culture that nurtures them towards creating superior value for customers as well as the organization. Kohli and Jaworski (1990) focus MO on the generation, dissemination of, and response to market intelligence. Superior customer value is created through a behavioral cycle of collecting and critiquing customers and competitors. Market-oriented firms seek to discover and understand current and potential customers' needs, monitor and react to current and potential competitors, and focus capabilities and resources on exploiting opportunities that arise (Menguc and Auh, 2006; Panigyrakis and Theodoridis, 2007). They are distinguished in sensing market events and trends, broadly shared throughout the organization, acting coherently to retain or attract customers, improve channel relations, and thwart competitors.

Despite limited attention being given to MO in SMEs by research, Kara, Spillane and DeShields (2005) found that it could be positively related to their performance. Analoui and Karami (2003) view MO as a means of clarifying management thinking and providing direction for SMEs in establishing priorities and improving the quality of marketing knowledge. Simmons and colleagues, for example, found that MO in SMEs was critical to their adoption and optimization of websites (Simmons, Armstrong and Durkin, 2008; 2011). High levels of MO in SMEs are associated with greater flexibility and responsiveness to market conditions (Pelham and Wilson, 1996; Didonet, Simmons, Díaz-Villavicencio and Palmer, 2012). For SMEs a limited resource base and simpler organizational structure may enhance their capacity for adjustment to

changing customer wants and needs through MO as compared to larger firms (Blankson and Omar, 2002; Li, Zhao, Tan and Liu, 2008; Moriarty, Jones, Rowley and Kupiec-Teahan, 2008). Notwithstanding, Harris and Watkins (1998) found constraints for SMEs in adopting MO, pertaining to ignorance of the concept and its application, perceived inappropriateness, contentment with status quo, short-termism in their marketing planning, and unclear views of the customer. We contend that critical to developing the literature on MO in SMEs is a better understanding of the relationship between MO and innovation. More specifically, this will also contribute to furthering an understanding of MO's relevance to innovation success in SMEs.

Research into innovation in SMEs (e.g. Laforet and Tann, 2006; Laforet, 2008; Bigliardi et al., 2011; Hoffman et al., 1998; Barnett and Storey, 2000), has largely neglected to consider strategic orientations such as MO. Researchers have highlighted a role for MO in supporting innovation that can positively contribute to performance (see for e.g. Salavou, Baltas and Lioukas, 2004; Dibrell, Craig and Hansen, 2011). Research has shown that MO can support innovation that generates superior value for customers, which in turn can generate superior firm performance (Narver and Slater, 1990; Kohli and Jaworski, 1990; Slater and Narver, 1994; Langerak, Hultink and Robben, 2004). Notwithstanding, there is evidence that smaller firms' ability to achieve innovation success is challenging, due to constrained financial resources and limited market power (see for example Chandy and Tellis, 2000).

Resource constraints emphasize the importance for SME innovation success of sources of innovation that include supply chain links (upstream and downstream of the firm) (Barnett and Storey, 2000; Chen et al. 2010) and other external sources (universities and research institutes, trade fairs, government bodies) (Hashi and Stojcic, 2003; Laforet and Tann, 2006; Lööf and Heshmati, 2002; 2006). Government bodies for example have been highlighted as critical

sources of innovation for SMEs by several authors (see for example Donnelly, Simmons, Armstrong, and Fearne, 2013; Hashi and Stojcic, 2013). Also important are intra-firm mechanisms to support innovation in SMEs that include HRD practices (e.g. employee training and performance) and the use of systems and technology (e.g. use of information technology to design prototypes and share information internally on new product development and processes) (Hoffman et al. 1998; Laforet and Tann, 2006).

A particular challenge for many SMEs in achieving innovation success pertains to the development of new products and services that have relevance for the markets they serve (Baker and Sinkula, 2009). This emphasizes the importance for SMEs to link of sources of innovation and intra-firm mechanisms. The boundary-spanning role of MO in this paper is seen to be critical to linking sources of innovation and intra-firm mechanisms to support market-focused innovation in SMEs. The notion of boundary-spanning from a marketing perspective is in keeping with dimensions of MO defined by, for example, Narver and Slater (1990) – customer orientation, competitor orientation and inter-functional coordination. MO's boundary-spanning role forms a link between SMEs' internal (inter-functional coordination) and external environment (customers, competitors) in supporting market-focused innovation. Literature has considered MO's boundary-spanning role as internal marketing activities integrating with suppliers and/or customers external to the firm (Singh, 1998; Stock, 2006; Stock and Zacharias, 2011). Hult (2011) considers firms' boundary-spanning as integrative and mutually reinforcing internal components of firms' marketing activities, customer value-creating processes with external networks and stakeholders. For firms, boundary-spanning activity can therefore help define their goal structure, strategy, and implementation plan (Aldrich and Herker, 1977; Dollinger, 1984; Evan, 1966; Jemison, 1984). Aldrich and Herker (1977, p. 221) assert "the organization's ability to cope with environmental constraints depends in part on the ability of

the boundary spanning individual to achieve a compromise between organizational policy and environmental constraints." In this context we promote MO's boundary-spanning role as a knowledge broker for SMEs (Bergenholtz, 2011), integrating sources of innovation and intra-firm mechanisms around *market-focused* new products and services. In the next section we hypothesize the relationships between MO, sources of innovation and intra-firm mechanisms for innovation in SMEs. A research model is presented in Figure 1.

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Hypotheses Development

The presence of MO facilitates the necessary behaviors in firms for generating superior and differentiated value for customers (Narver and Slater, 1990). Considering the role of MO in the implementation of a premium product differentiation strategy (PPD), Homburg, Krohmer and Workman (2004) highlight its importance as an instrument of strategy implementation. Baker and Sinkula (2009) found that while MO can have a direct effect on an SME's profitability, it also had an indirect effect mediated by innovation success. Innovation success refers to wholly new product concepts, brand and line extensions and customer service improvements by which firms maintain and expand consumer and product markets (Baker and Sinkula, 2009). Verhees and Meulenberg (2004) and Dibrell et al. (2011) view innovativeness as the basis for the relationship between MO and innovation success in SMEs as innovativeness. Innovativeness is defined as a firm's openness to new ideas as an aspect of a firm's culture (Hult and Ketchen, 2001; Hurley and Hult, 1998; Verhees and Meulenberg, 2004). This openness to new ideas points to the efficacy of different sources of innovation for SMEs emanating from supply chain linkages and other external sources such as university knowledge transfer activities. Hashi and Stojcic (2013), while not directly referring to MO, suggest that new ideas and motivation in

responding to markets draw upon and leverage such sources of innovation. Hurley and Hult (1998) suggest that MO focuses new ideas and motivation in response to the market, drawing upon and leveraging sources of innovation and promoting in so doing innovativeness. This resonates with Bicen and Hunt's (2012) term 'alliance market orientation'. It represents a collaborative effort that leverages network alliances in guiding new product development activities, bringing sources of innovation from outside to inside firms and vice versa (Bicen and Hunt, 2012). New ideas and information underpin knowledge exchange with external actors, encouraged by MO in firms (Liu and Su, 2014). They state that the use of multi-company collaborative networks as sources of innovation in market-oriented firms can improve the chances of success of new product development, particularly given inherent constraints in time, finance and expertise faced by SMEs. We therefore hypothesize:

H₁: MO has a direct and positive effect on the degree to which SMEs use different sources of innovation.

A focus on the internal environment of the firm is required to ensure the coordinated use of sources of innovation from a firm's external environment to create superior value for customers with new products and services (Kohli and Jaworski, 1990; Narver and Slater, 1990; Day, 1994). Lööf and Heshmati (2002) note that the more innovative firms are the more they will need to enhance the skills of employees through training. Hashi and Stojcic (2013) indicate that critical to the pursuit of sources of innovation will be staff training in sourcing know-how regarding complementary sources of innovation and new product development processes. Employees engaged with innovation process in firms spend their time not only on individual areas of responsibility, but also pursuing and exchanging with colleagues sources of innovation through participation in trade fairs, exhibitions and other networking activities (Lööf and

Heshmati, 2002). This is particularly relevant in the initial stages of innovation process in firms (i.e. fuzzy front end of innovation) when customer needs and technologies trigger trends and ideas (Liu and Su, 2014). Also viewed as being critical to the pursuit of sources of innovation is a firm's technology strategy and management, including investments in design improvements and the ease of use of a systems and technologies for supporting innovation (Laforet and Tann, 2006). As highlighted by Bigliardi et al. (2011), more innovative firms have better systems and technology in place to support innovation than less innovative companies. To sum up, Hashi and Stojcic (2013) state that the decision by a firm to develop new products or services leading to the pursuit of different sources of innovation requires effective intra-firm mechanisms to support innovation (see also Liu and Su, 2014; Didonet and Díaz, 2012). We hypothesize:

H2: The extent to which SMEs use different sources of innovation has a direct and positive effect on intra-firm mechanisms for innovation.

Sources of innovation need to be exploited at the firm level in SMEs as new products and services that customers want (Liu and Su, 2014). Mosey, Clare and Woodcock (2002), while not overtly referring to MO, found from a study of thirty SMEs that the more innovative firms used external sources of innovation from, for example, customers and trade shows, to directly inform their new product development. Critical to this was the integration of sources of innovation with internal decision-making and communication that was democratic and multifunctional and, critically, *able to make use* of sources of innovation in strategic new product development *that met* market needs. Sources of innovation in market-oriented SMEs are therefore likely to be reliant on democratic and multifunctional intra-firm mechanisms defined by people and technology acting as knowledge brokers in developing innovations that have customer relevance (Day, 1994; Dibrell et al. 2011). Various authors highlight the importance in this regard of having effective HRD practices (Barnett and Storey, 2000;

Langerak et al. 2004; Slater and Narver, 1994). Slater and Narver (1994) assert that employees have an important role for market-oriented firms in maintaining external relationships, viewed as critical to delivering superior customer value. They highlight a need for HRD practices to focus on creating an awareness of market needs (through employee training and performance practices). Other authors note the importance of communication technologies within market-oriented firms to successfully exploit sources of innovation as market-focused innovations (Laforet and Tann, 2006; Bigliardi et al. 2011). Bigliardi et al. (2011) note that SMEs require intra-firm information technologies to leverage sources of innovation in developing differentiated new product characteristics. In web 2.0 environments where firms need to pass sources of innovation round functions and *respond rapidly* to individual existing customers, or potential customers, conversing on social media platforms, intra-firm technologies are even more important for SMEs (Simmons, Armstrong and Durkin, 2011). MO's boundary-spanning role for SMEs in defining and exploiting different sources of innovation therefore incorporates a reliance on intra-firm mechanisms including human resource development (HRD) practices and the use of systems and technology to support market-focused new products and services. We hypothesize:

H₃: MO has an indirect and positive effect on intra-firm mechanisms for innovation via the extent to which SMEs use different sources of innovation.

Methodology

Sampling, Data Collection and Study Context

The sample selected for this study was drawn from the database of a project entitled 'Demography of the Regional Small and Medium size Enterprises', undertaken by researchers at the Entrepreneurship and SME Center at Universidad Católica del Norte, Chile. A sample of 550 SMEs from the district of Antofagasta in northern Chile was selected. The criterion adopted

for the definition of SME was the sales volume of each company, according to the government criterion in Chile. In accordance with this criterion, an SME was defined as having an annual sales volume of no less than US$ 104,375.00, and no more than US$ 4,348,980.00 (reference values in Chilean pesos, the national currency, converted to US dollars according to the exchange rate of 15th July, 2014). Considering this criterion, and excluding micro firms and missing values, a sample of 325 SMEs was considered valid for the study. Of the 325 SMEs researched, 269 were small firms (82.8 percent) and 56 corresponded to the category of medium sized firms (17.2 percent of the total). The data was collected between September 2009 and August 2010 via a cross-sectional survey. A team of researchers administered questionnaires with Directors or owners of the sampled SMEs. They were previously contacted by the researchers and asked about their availability to respond to the questionnaire. Subsequently, just the Directors that agreed to participate in the survey were finally interviewed. This procedure ensured non-response bias and it was in line with Armstrong and Overton's (1977, p.396) statement that "the most commonly recommended protection against nonresponse bias has been the reduction of nonresponse itself". Once the researchers completed the questionnaire component, the project coordinator followed up on their work by randomly selecting and then telephoning some of the SMEs to confirm the data obtained. This procedure ensured control over the research conducted and guaranteed the reliability of the data collected.

Chile offered an interesting location for the study due to its macroeconomic profile. The country occupies first place among the countries of Latin America and the Caribbean in the global competitiveness ranking of the World Economic Forum (2013). Sustainable economic growth, commercial openness, macroeconomic stability, institutional efficiency and transparency are some of the aspects that justify Chile's leadership in the region (World Economic Forum, 2013). Additionally, the country's openness index indicates that Chile has an exposure level of 70

percent to international trade (Milesi, Moori Robert, and Yoguel, 2007), which can be translated into greater competitiveness for its domestic industry. As for SMEs, they contribute a total of 13 percent of the country's gross domestic product (GDP) and provide 38 percent of the total employment according to the 2006 data from the National Institute of Statistics (Instituto Nacional de Estadística [INE], 2008). In the northern region of Chile, SMEs contribute 7.4 percent of the GDP of the district of Antofagasta (where the study was conducted), which is historically known as the 'mining capital of Chile', and where many large multinational copper and mineral extractors operate.

Measures and Validation

Three constructs were considered in the measurement model: (1) market orientation; (2) sources of innovation; (3) intra-firm mechanisms for innovation. Fifteen variables of market orientation (MO) corresponded to the three dimensions of the construct defined by Narver and Slater (1990), that is, customer orientation, competitor orientation and inter-functional coordination. Eight variables of sources of innovation (SI) corresponded to the extent to which a company uses different sources of innovation (Laforet and Tann, 2006; Hashi and Stojcic, 2013) – to include supply chain links (SI_CHAIN) (upstream and downstream) and other external sources (SI_EXT) (universities and research institutes, fairs, national and international public organizations). The variables of intra-firm mechanisms for supporting innovation (IN) included four strategies for human resources development (IN_HRD) (Barnett and Storey, 2000; Chen et al. 2010) and four practices representing the use of systems and technology for supporting innovation (IN_TI) (Laforet and Tann, 2006; Hoffman et al., 1998). All variables were measured in a continuous scale of seven points, ranging between the extremes of 'never' and 'always'.

Two types of measures were considered: reflective and formative. The innovation-related variables (i.e. SI and IN) were modeled as reflective second-order constructs. MO was considered a formative second-order construct (Jarvis et al., 2003; Cadogan, Souchon, and Procter, 2008). The three first-order MO components (customer orientation, competitor orientation, interfunctional coordination) are formative indicators of the MO construct. This is because these components together determine the overall level of MO and its corresponding items cover diverse activities that the organization may or may not perform (Rodríguez-Pinto et al., 2011). Formative constructs, in contrast with reflective ones, imply that each measure captures differing aspects of the construct (Petter, Straub, and Rai, 2007). Thus, "changes in the measures are hypothesized to cause changes in the underlying construct" (Jarvis, Mackenzie and Podsakoff (2003, p.201). Unlike in reflective models changes in the underlying construct are hypothesized to cause changes in the indicators (Jarvis et al., 2003). This means that reflective constructs have observed measures that are affected by an underlying construct (Petter et al., 2007).

The items were subjected to an exploratory factor analysis with varimax rotation: (1) to ratify the second-order factors of constructs that were previously defined in the literature. This is appropriate when the latent variables are formed by a large number of indicators (Bagozzi and Yi, 2012); (2) to check the internal validity of the items of SI and IN constructs. The items that did not demonstrate acceptable loading (high internal validity) were eliminated from both constructs.

Cronbach's alpha was verified considering the revised final scale (after items were dropped). The coefficients' range was .65 - .82. In terms of the reliability results for IN-HRD ($\alpha = .67$) and IN-TI ($\alpha = .65$) (see Table 1), low alphas may not be a major impediment to use in further analysis (Schmitt, 1996). By discussing specification and other aspects of structural equation

models (SEMs), Bagozzi and Yi (2012, p.17) also observe that "reliability might be taken with some leeway in mind (…) old standards for Cronbach's alpha and other formulae for reliability should not be applied rigidly to SEMs, and indeed focus should be placed more on the hypotheses under tests, and goodness-of-fit". Thus, we assume that these relatively low alphas may not represent difficulties for subsequent analysis. Furthermore, taking into account that the questions regarding both dimensions of IN construct were taken from different sources (Barnett and Storey, 2000; Chen et al., 2010; Laforet and Tann, 2006; Hoffman et al., 1998), and considering the adjustment of the scale to the local context, the values found here are considered adequate and approach those defined by Nunnally (1970) and Hair, Anderson, Tatham and Black (1999) for exploratory studies. Additionally, recent studies that refer to market orientation in an innovation context found low alphas in their scales as well. This is the case for Narver, Slater and MacLachlan's (2004) study, with reliability measurements of between .68 and .94, and the study of Liu and Su (2014), with values between .61 and .90.

With regard to the formative nature of the three first-order MO components, the reliability of dimensions that is verified by Cronbach's alpha is not applicable (see Table 1). As Petter et al. (2007, p.626) state, "internal consistency or reliability is unimportant because measures are examining different facets of the construct". Hence, there is no reason to expect measures to be correlated and, consequently, internal consistency is not implied (Jarvis et al., 2003). Indeed, as noted by Jarvis et al. (2003, p.202), "internal consistency reliability is not an appropriate standard to evaluate the adequacy of the measures in formative models". Instead, multicollinearity is an undesirable property in formative measurement models (Diamantopoulos, Riefler and Roth, 2008; Petter et al., 2007). Therefore, the indicator of collinearity was assessed for each component of MO scale using variance inflation factors (VIF). All VIF values were below commonly accepted thresholds (VIF<10) (Rodríguez-Pinto

et al. 2011): customer orientation (max VIF=1.13), competitor orientation (max VIF=1.28), interfunctional coordination (max VIF=1.09). Therefore, multicollinearity is not a problem for subsequent analysis.

A confirmatory factor analysis (CFA) using AMOS v.18.0 was finally conducted to confirm the constructs under study. The results showed good fit (x^2/df = 1.971, NFI = .890, IFI = .913, CFI = .912, NNFI = .896, SRMR = .059, GFI = .896, AGFI = .887, RMSEA = .06, p-close fit = .329) (Bagozzi and Yi 2012). Convergent validity of the reflective scales (Rodríguez-Pinto et al., 2011; Jarvis et al., 2003) was confirmed by the factor loadings of each of the measurement items with values ranging between .60 and .86 and significant at .05 level (p< .05) (Gerbing and Anderson, 1988; DeClercq and Zhou, 2014) (see Table 1). The results of AVE estimates of reflective measures with values of .53 and .55 (Bagozzi and Yi, 2012), also revealed convergent validity (see Table 1). Regarding the formative measures of the MO construct, convergent validity is not applicable (Rodríguez-Pinto, et al., 2011). As noted by Mackenzie, Podsakoff and Podsakoff (2011, p.313), convergent validity is not relevant in these cases because "the composite latent construct model does not imply that the indicators should necessarily be correlated." Table 1 illustrates the item's loadings and *t* values of CFA as well as the Cronbach's alpha, AVE and composite reliability (CR) of reflective constructs.

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Furthermore, we employed Anderson and Gerbing's (1988) procedure to assess discriminant validity. We compared every pair of constructs in the unconstrained model with the constrained model in which the correlation between two constructs set one (Anderson and Gerbing, 1988). We found a significant lower chi-square value for the unconstrained model, which indicates

that discriminant validity was achieved. Also, none of the confidence intervals for the correlations between constructs included 1.0 (p< .05) (Anderson and Gerbing, 1988). A similar procedure was applied recently by DeClercq and Zhou (2014). Additionally, the square root of AVE of each reflective construct was greater than its correlation with the corresponding pairs of constructs (see Table 2), which attest the discriminant validity of constructs as well (Fornell and Larcker, 1981).

Additionally, correlations among the constructs were verified. The results showed correlations between .291 and .424, which can be considered reasonable for subsequent analysis (Bagozzi and Yi, 2012). Table 2 shows these results.

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Common Method Bias

A common method bias may occur considering that all the measures of the constructs were collected from the same source (Podsakoff, MacKenzie, Lee and Podsakoff, 2003). This potential problem was checked with the Harman one-factor test (Podsakoff and Organ, 1986). A factor analysis of focal variables resulted in the seven focal factors with eigen values greater than 1, which accounted for 58.9 percent of the total variance. The first factor accounted for 22 percent of the variance. Because a single factor did not emerge and factor 1 did not explain most of the variance, common method bias is unlikely to be a concern with the data. We also examined the data for empirical evidence of common method bias by applying the single-common-method-factors approach, as recommended by Podsakoff et al. (2003). We conducted a CFA, which included a construct representing an unmeasured methods factor. Each variable was specified to load onto this factor in addition to its theoretical construct. The results showed that each item loaded significantly on its intended theoretical construct, with no load in the

unmeasured methods factor. Overall, the item loadings were substantially higher on their intended construct than on the unmeasured factor and we can conclude that common method bias does not appear to be a problem in the study. A similar procedure was applied by Lai, Griffin and Babin (2009).

Findings

Covariance-based path analysis with maximum likelihood estimation (AMOS v18.0) was used to estimate the parameters. Significance levels were based on bias-corrected bootstrap confidence intervals (Rodríguez-Pinto, Carbonell and Rodríguez-Escudero, 2011). In order to ensure statistical significance in the model, adjustments were previously made to the dimensions of the reflective constructs (i.e. SI and IN) and some items of constructs were dropped (see Table 1).

Taking Sources of Innovation (SI) and Intra-firm Mechanisms for Innovation (IN) as reflective second-order constructs and MO as a formative second-order construct, the model showed good fit (x^2/df = 1.933, NFI = .889, IFI = .911, CFI = .910, NNFI = .895, SRMR = .059, GFI = .901, AGFI = .896, RMSEA = .054, p-close fit = .211) (Bagozzi and Yi 2012). The relationships were calculated considering the direct and indirect effects among the constructs. Since direct and indirect effects were tested, the Durbin-Wu-Hausman (DWH) test was applied to verify the endogeneity of constructs using Stata 11.1 software (Lee and Park, 2009) as indicated by Davidson and MacKinnon (1993). This is a test that is largely used by other researchers (see Lee and Park, 2009; Zaheer and Soda, 2009; Sorenson, 2003). Following Davidson and Mackinnon (1993) proposition, two steps were applied to perform DWH test. First, the potentially endogenous variable, i.e. SI, was regressed on the exogenous variable (MO). The residuals from the regression model of the expected endogenous variable were retrieved. Second, the residuals (*SI_residuals*) were included as a covariate in the second stage model

which considered the exogenous variable and the dependent variable (IN). The results of the test confirmed SI as an endogenous variable (t-value =5.99; p-value=.015).

Furthermore, to confirm the mediating role of SI in the relationship between MO and IN, the mediation test was performed considering Baron and Kenny's (1986) procedure. The three steps recommended by Baron and Kenny (1986) were followed to examine: (1) whether the independent variable, i.e. the MO construct, has a significant impact on the mediating variable (SI construct); 2) whether the independent variable (MO construct) significantly impacts on the dependent variable (IN construct), and (3) whether the independent variable (MO construct) has a significant influence on the dependent variable (IN construct) when the mediator variable (SI construct) is added to the equation. In this case, the mediator variable (SI construct) must affect the dependent variable (IN construct). If all these conditions are satisfied and the size of the effect in condition (2) is significantly higher than that of condition (3), there is a partial mediation. Full mediation exists when the independent variable has no effect when the mediator is controlled (Baron and Kenny, 1986). The results are shown in Table 3.

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As can be observed in Table 3, the results of the first regression revealed that the three dimensions of MO significantly affect the two dimensions of SI. The results of the second regression showed that the three dimensions of MO have a significant impact on IN. Finally, results of the third regression revealed that the two dimensions of SI affects both dimensions of IN. Furthermore, the effect of the three dimensions of MO on both dimensions of IN is less than the result revealed in the second regression. Hence, the mediation was confirmed (Baron and Kenny, 1986).

Table 4 shows the direct and indirect effects of MO on SI and IN constructs of the model.

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The results shown in Table 4 indicate that MO has a direct and positive effect on the degree to which SMEs use different sources of innovation. The coefficient of .753 and p-value of .001 confirm this relationship providing support for H_1. This indicates that market-oriented SMEs actively source information, whether from among supply-chain links or external sources, which may be of use in the development of new products and/or services that are relevant to market needs. The results in Table 4 also reveal that the extent to which SMEs use different sources of innovation directly and positively affects intra-firm mechanisms for innovation (coefficient of .524 and p-value of .004), providing support for H_2. This indicates that by seeking out different sources of innovation, SMEs create the conditions for internal mechanisms to support innovation. These mechanisms include human resource development activities and the use of systems and technology for supporting innovation. Furthermore, the results shown in Table 4 also provide support for H_3. The coefficient of .395 and p-value= .001) reveals that MO has an indirect and positive effect on intra-firm mechanisms for innovation via the extent to which SMEs use different sources of innovation. This suggests that market-oriented SMEs in seeking sources of innovation require at the firm level effective people and technology to exploit these sources in market-focused new product and service development. Additionally, different sources of innovation in conjunction with MO require intra-firm mechanisms to support innovation in SMEs that is market-focused.

Discussion and Implications

Previous research into innovation in SMEs has largely neglected to consider the role of strategic

orientations. The role of MO more specifically for SMEs in supporting innovation is not sufficiently explored (Salavou et al. 2004; Baker and Sinkula, 2009), which is more concerned with the impact of firm-specific characteristics on innovation (Laforet and Tann, 2006; Dibrell et al. 2011; Bigliardi et al. 2011). In this paper an empirical study is conducted to examine the relationship between MO, sources of innovation (specifically – supply chain links and other external sources) and intra-firm mechanisms (specifically – HRD and technology) to support innovation in SMEs. The study findings provide new insights that show how the relationship between MO and innovation is critical to understanding MO's importance for SMEs, as well as MO's relevance to innovation success. To better understand these relationships we consider MO's boundary-spanning role in SMEs, moving beyond a focus on owner/managers. This also acknowledges Hult's (2011) conception of marketing's key boundary-spanning role, which he believes is redefining the very composition of organizations.

The study findings reveal that the three dimensions of MO (customer orientation, competitor orientation and inter-functional coordination) significantly affect the two dimensions of sources of innovations (supply chain links and other external sources such as universities involved in knowledge transfer). Specifically, MO provides a market-centric focus for SMEs in drawing down different sources of innovation in the development of new products and services that are relevant to customer needs. Further, the study found that the two dimensions of sources of innovation positively affect both dimensions of intra-firm mechanisms for innovation (four strategies for human resources development and four practices representing the use of systems and technology). The pursuit of different sources of innovation by the studied SMEs creates the conditions for intra-firm mechanisms to support innovation. Sources of innovation were reliant on appropriate intra-firm mechanisms in HRD (employee recruitment, training, and retention) and technology (strategy and management) in the SMEs studied. Lastly, we found that MO has

an indirect and positive effect on intra-firm mechanisms for innovation via the extent to which the studied SMEs use different sources of innovation. Market-oriented SMEs seeking sources of innovation require effective firm-level mechanisms to exploit them through market-focused new product and service development.

Ultimately, intra-firm mechanisms such as HRD and technology to support market-focused innovation are only as good as the decisions that are actually made by people in SMEs. This reinforces the importance of an SME's employees working effectively with sources of innovation, for example, customers, government bodies and universities. It holds particular pertinence given SMEs' inherent resource constraints. Slater and Narver (1994) assert that employees have an important role in maintaining relationships viewed as critical to delivering superior customer value in market-oriented firms; noting the importance of HRD practices that create an awareness of market needs through employee training. They state that market-oriented firms "take great care to recruit and retain the best people and provide them with regular training" (Slater and Narver 1994, p.23). Previous research has shown that the information-processing characteristic is an important talent for employees when engaged in intensive boundary spanning and thereby strategic action (Dollinger, 1984; Stock, 2006; Stock and Zacharias, 2011). The role of technology as an integral intra-firm mechanism can support this through facilitating effective inter-functional communication that allows employees to process and respond rapidly to information on individual existing customers, or potential customers, needs with new product and service offerings.

To sum up, the study findings reveal that MO is critical to SMEs as a 'linking pin' between the internal and external environment, integrating sources of innovation with intra-firm mechanisms around new product and service development that meet customer needs. Boundary

spanning defined by the level of MO present in the SMEs studied, is therefore critical to their strategic alignment to the market with new products and services. Research on SMEs has largely focused on the owner/manager as a mediator between internal and external forces in achieving strategic alignment. Early seminal work by researchers such as Dollinger (1984) draws attention to the owner/manager's characteristics in performing the strategic management tasks of balancing the interests of the environment and the firm in which they are dominant. For Dollinger (1984) owner/managers in SMEs take a boundary-spanning role, with their strategic activities manifesting themselves as boundary-spanning activities. Research attention in SME literature has tended to focus on the personal characteristics of owner/managers more generally (e.g. Gilmore, Carson and Grant, 2001; Clarke, Thorpe, Anderson and Gold, 2006; Simmons et al. 2011). Recent work studied MO in SMEs from the perspective of owner/managers. Donnelly, Simmons, Armstrong and Fearne (2015), for example, consider the MO of SME owner/managers as being central to how Big Data market intelligence is utilized and impacts upon their capacity for innovation. Baker and Sinkula (2009) assert that MO creates the necessary innovation behaviors in SMEs for generating superior value for customers, acknowledging a key role for owner/managers in decision-making. Similarly, Verhees and Meulenberg (2004) found that owner/manager innovativeness influenced SME MO, innovation and performance. While not denigrating the position of owner/managers and their personal characteristics in SME research, rather than being concerned solely with what Aldrich and Herker (1977) term the 'individual' we draw attention from the study findings to *MO's boundary-spanning role* in SMEs. We contend from the study findings that MO's boundary-spanning role links sources of innovation and intra-firm mechanisms to support *market-focused innovation* in SMEs. Essentially, MO becomes what Bergenholtz (2011) terms a knowledge broker for SMEs, spanning internal and external network boundaries in the pursuit of innovation relevant to market conditions.

Limitations and Future Research Directions

There are some limitations to this research, as well as directions for future research. Prior research points to the possibility for different relationships with the innovation process that are dependent upon MO dimensions (for example Gatignon and Xuereb, 1997; Han, Kim and Srivastava, 1998; Laforet, 2008; Lukas and Ferrell, 2000; Balas, Colakoglu and Gokus, 2012; Carbonell and Rodríguez Escudero, 2010). These differences may be better understood by relating MO dimensions to innovation in SMEs, something that could be specifically considered in future research. For example in applying Kohli and Jaworski's (1990) MO dimensions, Carbonell and Rodríguez Escudero's (2010) research revealed that intelligence generation and intelligence dissemination does not influence new product performance. This was attributed solely to the responsiveness of the firms. Following this perspective, different sources of innovation for SMEs, as identified in our study, could be related to the dimensions of MO in future studies. Considering that SMEs adapt their MO depending on uncertain environmental conditions (Didonet et al. 2012), perhaps they reinforce one or more MO dimensions depending on the source of innovation and on the level of environmental uncertainty related to the source. How this then translates to intra-firm mechanisms in SMEs may also be an interesting area for further research. Consideration of intra-firm mechanisms (for example HRM) along with dimensions of MO and sources of innovation may reveal that such mechanisms face specific pressures to change and adapt in order to support innovation in SMEs; depending on the MO dimension and source of innovation. The inherent complexity in these relationships highlighted by Hashi, and Stojcic (2013), centers on the complexities of the innovation and channels that transform innovation inputs into innovation success. These points for further research could contribute to explaining the importance of specific dimensions of MO to innovation in SMEs.

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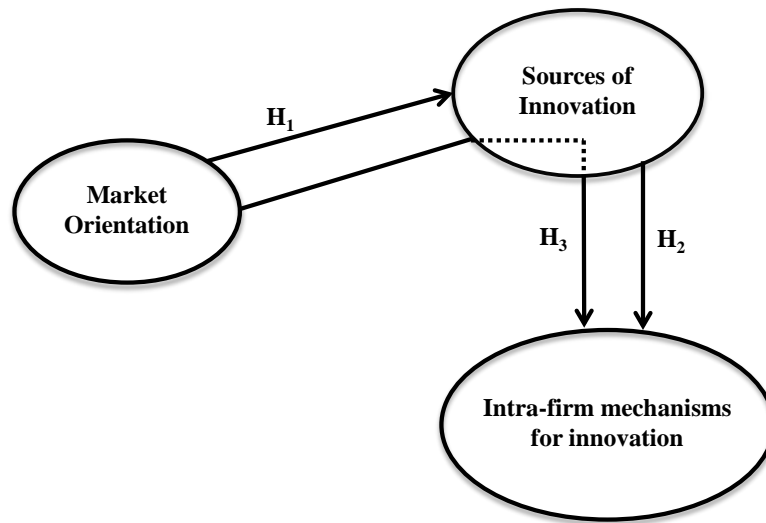
Figure 1 Research model

Table 1 Construct definitions and measures

Construct	Dimensions	Variable	Item Loading[b]	t value	Source
Intra-firm mechanisms for innovation (AVE=.53; CR=.70; α=.67)	Human Resources Development	The practice of job rotation among employees	.67	4.06	Barnett and Storey (2000); Chen et al. (2010)
		The use of external programs to train employees	.60	4.22	
		The use of internal programs to train employees	.86[c]		
		The use of a formal system to evaluate the performance of employees[a]			
	The use of systems and technology for supporting innovation	The use of information technologies to design prototypes	.77[c]		Laforet and Tann (2006); Hoffman et al. (1998).
		The use of information technologies to share information internally	.69	5.28	
		The use of information technologies for inventory/stock administration	.73	4.84	
		The use of information technologies in production[a]			
Market Orientation	Customer Orientation (n.a.)	Our decisions are taken with the aim that customers perceive that we provide the best services.	.66	7.85	
		We focus our efforts on customer satisfaction	.77	10.37	
		We do post-sale follow-up with our customers	.19	3.10	
		We are committed to our customers	.76	10.35	
		We know what our customers' needs are	.28	4.41	
		We conducted surveys to measure customer satisfaction	.24	3.10	
	Competitor Orientation (n.a.)	We respond rapidly to our competitor's actions.	.74	14.54	
		The information gathered about the competition is shared among departments of our firm.	.85	14.58	
		We frequently analyze the strengths and weaknesses of our competitor	.85	14.60	Narver and Slater (1990)
		Our objectives are oriented to markets where we have advantages over our competitor	.55	9.50	
		All of us who work in the firm make an effort to maintain contact with our current customers and with possible future customers.	.76	7.83	
	Inter-functional Coordination (n.a.)	All of us who work in the firm are committed to meeting the needs of our customers	.74	11,18	
		We share the resource among all the departments of our firm.	.59	9.39	
		The activities of our firm are coordinated among the departments.	.57	9.05	
		All functions contribute to customer value	.33	4.78	
Sources of Innovation (AVE=.55; CR=.73; α=.82)	Supply Chain Links	Customers	.64	8.57	Laforet and Tann (2006); Hashi and Stojcic (2013)
		Competitors	.84	7.99	
		Firm´s internal sources	.61[c]		
		Suppliers[a]			

External Sources		.86	11.83
	International Organizations	.86	11.83
	National Public Organizations	.78	11.80
	Fairs	.70c	
	Universities and Research Institutesa		

a suppressed item; b standardized loadings; c the t value is not available because the item was restricted to 1 to set the scale

n.a.: not applicable

Table 2 Correlation matrix of constructs

	(a)	(b)	(c)
Market Orientation (a)	n.a.		
Sources of Innovation (b)	.424**	**.742**	
Intra-firm mechanisms for innovation (c)	.294**	.291**	**.728**

Significance levels: **p<.01 (two-tailed test)

Note: Bold numbers on the diagonal show the square root of AVE

n.a.: not applicable

Table 3 Mediation test - Baron and Kenny's (1986) procedure

		Path			β	p (two-tailed)
Model 1	SI	<---	MO		.753	.001
Model 2	IN	<---	MO		.284	.022
Model 3	IN	<---	MO		.195	.051
		<---	SI		.524	.000

Table 4 Results of hypotheses test

Hypotheses		Path		Direct Effect				Indirect Effect				Status of Hypotheses
				Estimate (β)	S.E.	p (two-tailed)	t value	Estimate (β)	S.E.	p (two-tailed)	t value	
H_1	SI	<--	MO	.753	.095	.001	3.299	----	---	----		Confirmed
H_2	IN	<--	SI	.524	.146	.004	4.129	----	---	----		Confirmed

H₃	IN < SI < MO	----	---	----	----	.395	.120	.001	3.559	Confirmed