

# Psychic Distance, Innovation, and Firm Performance

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**Abstract** Previous research suggests that internationalization improves a firm's ability to innovate, but the effect of internationalizing into specific target markets or destinations on the innovation ability of firms has not been fully investigated. This study examined whether the psychic distance between target market and home market affects firms' propensity to innovate. The starting assumption was that perception of a high degree of differences and subsequent environmental uncertainty when expanding into psychically distant markets triggers strategies for interacting and integrating with the market environment. These include producing and adopting innovations to processes and products and to organizational strategy, structure, and administrative procedures to cope with the new environment and overcome uncertainties. These innovations and the associated competitive advantages can improve firm performance. Hypotheses regarding the relationships between psychic distance, innovation, and firm performance were tested here by structural equation modeling using data from 186 export ventures into 23 international markets by Swedish companies. The results indicate that the link between psychic distance and firm performance is mediated by innovation.

**Keywords** Psychic distance · Innovation · Internationalization · Firm performance · Uncertainty

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## 1 Introduction

Innovation is generally viewed as an important determinant of a firm's competitiveness and as enhancing its organizational performance (Fagerberg et al. 2005; Damanpour and Evan 1984; Han et al. 1998; Damanpour and Aravind 2011). Previous research has shown that innovation has a particularly strong effect on the performance of highly internationalized firms (Kafouros et al. 2008). Operating in foreign markets enriches a firm's sources of knowledge and other strategically relevant resources and increases its learning capacity, all of which have key roles in innovation. Through internationalization, firms may access ideas and expertise from new and different markets that improve their abilities to innovate. Internationalization enables the firm to acquire materials and inputs from the most economical sources around the globe (Kafouros et al. 2008; Kotabe et al. 2002; Hitt et al. 1997). Kafouros et al. (2008) therefore argue that greater internationalization can lead to greater returns from innovation.

Despite much research into the relationship between firm internationalization and innovation (Hitt et al. 1997; Kafouros et al. 2008; Kotabe et al. 2002), little attention has been paid to the effect of the "destination" of internationalization on innovation (Alvarez and Robertson 2004). The destination refers to the foreign market(s) in which firms operate (e.g., through exporting). Alvarez and Robertson (2004) categorized export destinations in developing and developed markets and found that the destination of exports influences firms' innovation activities. They revealed that firms which export to developing countries are more likely to have R&D units and to invest in product design, whereas firms which export to developed countries are more likely to invest in new products and production processes. It has been claimed that exporting to developed markets requires upgrading of production processes (technology) to meet the market's specifications, while exporting to developing markets demands leadership in product design and research (Gereffi 1999).

Firms can internationalize to markets at varying psychic distance from the home market. Psychic distance is a perceptual distance between the firm's home market and a foreign market, and it results from the perception of both cultural and business differences between the home market and the foreign market (Evans and Mavondo 2002; Evans et al. 2008). Entering psychically distant markets leads to high perceived levels of uncertainty (O'Grady and Lane 1996; Evans and Mavondo 2002) since the firm sees itself as lacking sufficient market information to accurately predict the challenges facing it in the new foreign market (Yamin and Sinkovics 2006; Penrose 1959). The perception of uncertainty has been shown to stimulate a firm's propensity to innovate (Ettlie 1983; Freel 2005; Hrebiniak and Snow 1980; Huber et al. 1993; Ozsomer et al. 1997; Pierce and Delbecq 1977; MacCormack and Verganti 2003). This process of innovation is a crucial component of a firm's strategy (Gunday et al. 2011), by acting as a means to facilitate its adaptive changes to the environment and cope with environmental uncertainties (Damanpour and Evan 1984; Damanpour et al. 2009). Innovation is thus a source of competitive advantage in international markets (Pla-Barber and Alegre 2007). According to Silva et al. (2010), the high competitive pressure of international markets pushes firms to adopt innovations in order to cope with environmental changes, meet

market conditions, and eliminate a performance gap caused by uncertainties in the environment (Damanpour and Evan 1984). However, no previous study has investigated uncertainty as a result of the psychic distance between home and foreign markets in prompting innovation.

Furthermore, much research has been devoted to the effect of innovation on firm performance but such research has mainly focused on one type of innovation, i.e., technological innovation, while the influence of organizational innovation on firm performance has been basically ignored (Damanpour and Evan 1984; Damanpour and Aravind 2011; Birkinshaw et al. 2008; Armbruster et al. 2008). A possible explanation for this omission is that relative to organizational innovation, technological innovation is generally perceived to have a more clear association with performance (Damanpour and Evan 1984). Adopting technological innovations results in the introduction of new technologies, more efficient production techniques, and new products and processes that create competitive advantages and hence enhance organizational performance (Hall and Mairesse 1995; Kafourous et al. 2008; Zahra and Covin 1995). However, according to Hamel (2006), organizational innovation can also provide sustained competitive advantages for the firm. Adopting organizational innovations results in changes in strategy, structure, and administrative procedures that improve, *inter alia*, the organization's climate, communication, personnel policies, teamwork, information sharing, and coordination and cooperation mechanisms (Gunday et al. 2011; Damanpour and Aravind 2011; OECD 2005a), all of which can enhance a firm's performance. Moreover, the structural improvements brought about by organizational innovations can create an appropriate environment for the initiation and adoption of other types of innovation (Gunday et al. 2011; Damanpour and Evan 1984).

Damanpour and Aravind (2011) argue that the adoption of a single type of innovation or even a set of only one type of innovation might not enable firms to fully realize the positive consequences of innovation on performance. Coping with changes and uncertainties in the environment and obtaining superior performance requires the balanced introduction of a portfolio of different types of innovations, i.e., both technological and organizational (Damanpour and Aravind 2011; Damanpour and Evan 1984). This argument builds on the resource-based view (RBV) according to which the synergistic use of technological and managerial knowledge resources is said to lead to the generation of technological and organizational innovations that enhance firm performance (Damanpour and Aravind 2011; Damanpour et al. 2009; Barney 1991; Camisón and Villar-López 2014; Amit and Schoemaker 1993).

The present study seeks to extend previous research on innovation and psychic distance by developing and testing empirically a framework that links these ideas. The main aim is to examine whether perception of a high level of uncertainty in psychically distant markets stimulates the adoption of innovations, leading to enhanced firm performance. Thus, the contribution of this study is as follows: first, we examined the importance of uncertainty as a result of psychic distance between home and foreign markets in explaining firm innovation strategies. Although much research has examined the effect of uncertainty on innovation, to the best of our knowledge no previous study has investigated the impact of uncertainty resulting

from the perception of cultural and business difficulties in foreign markets on firm innovation strategies. Knowledge of this is important, since implementing appropriate innovation strategies enables firms to overcome uncertainties and reap the benefits of business opportunities in psychically distant markets. We then tested the influence of cumulative adoption of innovation types (technological and organizational) on firm performance, building on the RBV, in order to determine the effect of organizational innovation on performance and synergistic use of different types of innovation. Lastly, we investigated the mediating role of adopting innovations in the relationship between psychic distance and firm performance. The study therefore also contributes to research on the link between psychic distance and firm performance. Although some previous studies have examined the effect of psychic distance on firm performance, the results have been extremely inconclusive (Prime et al. 2009).

The empirical part of this study was based on export ventures by a sample of Swedish companies classified as “low-technology” (OECD 2005b), henceforth “low-tech”. According to Mendonca (2009), despite their high economic importance and ability to innovate, low-tech industries still remain an “unprivileged research topic” as regards the effects of innovation.

The remainder of this paper opens with defining the concepts psychic distance and innovation, followed by a discussion of the proposed relationships between psychic distance, innovation, and firm performance. Next, the methodology applied in the research is presented. This is followed by the research findings and a discussion of the results. The paper ends with concluding remarks in which theoretical and managerial implications and directions for future research are discussed.

## 2 Psychic Distance: Perceived Distance to a Foreign Market

Psychic distance has been widely used to explain a firm’s behavior during the internationalization process (Dikova 2009). It is cited as an explanatory factor in, *inter alia*, the firm’s consecutive entry-mode decisions into international markets (Johanson and Vahlne 1977; Kogut and Singh 1988; Tihanyi et al. 2005; Kim and Hwang 1992); foreign market selection (Dow and Ferencikova 2010; Dow and Karunaratna 2006; Håkanson and Dow 2012; Blomkvist and Drogendijk 2013); and international marketing strategies (Evans and Bridson 2005; Evans et al. 2008; Sousa and Bradley 2005; Sousa et al. 2013).

Since Beckerman (1956) first introduced the concept of psychic distance, a variety of definitions have been proposed. Johanson and Vahlne (1977, p. 24) defined it as “the sum of factors preventing the flow of information from and to the market”. Examples of these preventive factors are differences in language, education, business practices, culture, and industrial development. Sousa and Bradley (2005, p. 44), emphasizing the perceptual nature of the concept, state that psychic distance refers to an “individual’s perception of the differences between the home country and the foreign country”. In the present study, we adopted the Evans and Mavondo (2002, p. 517) definition of psychic distance as “the distance between

the [firm's] home market and a foreign market, resulting from the perception of both cultural and business differences". We chose this definition because, first, it involves the notion of perception, which manifests the subjective nature of psychic distance (Prime et al. 2009; Swift 1999; Stöttinger and Schlegelmilch 1998; Sousa et al. 2013). According to Nebus and Chai (2014), psychic distance should capture a manager's perceptions of environmental factors (e.g., culture) that influence his or her decision since "managerial decision making is the process... through which psychic distance influences firm outcomes" (p. 2). Second, the notion of "distance" in this definition refers to similarity or difference between the home market and the host market, which is the most commonly used approach to measure (psychic) distance (Prime et al. 2009). Third, this definition contains the most important constituent dimensions of psychic distance, i.e., cultural and business distance (Prime et al. 2009; O'Grady and Lane 1996).

Research has shown cultural distance to be an important source of uncertainty for firms during their internationalization process (Johanson and Vahlne 1977; Ghemawat 2001; Shenkar 2001; Slangen and van Tulder 2009; López-Duarte and Vidal-Suárez 2010). Differences in norms, ideas, values, and beliefs in culturally distant markets increase the liability of foreignness and uncertainty in those foreign markets (Harzing 2003; Yamin and Sinkovics 2006; Zaheer 1995). Thus, cultural distance between countries can represent a barrier to the international transfer of information, influencing the collection and interpretation costs of critical management information (Carlson 1974).

According to the original definition of psychic distance by Johanson and Vahlne (1977), cultural differences are one of the main determinants of psychic distance. However, previous research has been criticized for using the concepts psychic distance and cultural distance interchangeably (Prime et al. 2009). According to Sousa and Bradley (2006), psychic distance and cultural distance are conceptually different; psychic distance should be assessed at the individual level, based on managers' perceptions, whereas cultural distance should be gauged at the cultural level. Strategic decisions and organizational behavior rely on managerial perceptions of the firm's environment (Child 1972; Anderson and Paine 1975; Robbins 1996; Starbuck and Mezias 1996; Beyer et al. 1997; Giaglis and Fouskas 2011). Therefore, some suggest using perceptual data for assessing cultural differences (Johanson and Vahlne 1977; Shenkar 2001; O'Grady and Lane 1996; Mezias et al. 2002; Harzing 2003; Zhao et al. 2004; Håkanson and Ambos 2010). In fact, in an empirical study of senior managers in manufacturing companies, Azar (2014b) found that the managers' perceptions of cultural distance were highly congruent with the objective measures of cultural differences among countries.

Cultural distance is a major component of psychic distance, but business distance is another important component which has been neglected to some extent (Evans and Mavondo 2002). Business distance refers to differences in legal and political environment, economic environment, market structure, and business practices in foreign markets (Evans and Mavondo 2002). Evans and Bridson (2005) found that the perception of business differences in foreign markets had a significant influence on adaptation of marketing strategies, owing to perceived uncertainty in markets with different structure and business practices.

It is thus important to operationalize the psychic distance construct using both cultural and business differences in order to reveal the true explanatory power of psychic distance (Evans and Mavondo 2002). In an empirical study of retailers, Evans and Mavondo (2002) concluded that neither cultural nor business distance individually influences a firm's performance, but that a combination of the two factors has a significant effect on performance.

### 3 Innovation: A Multifaceted Construct

Innovation is a multifaceted construct encompassing generation, development, and implementation of an idea or behavior new to the adopting organization (Damanpour 1996). During the innovation process, ideas are transformed into new products or services, new process technologies, new organizational structures, or new managerial approaches (Damanpour and Aravind 2011; Damanpour and Evan 1984).

A variety of typologies of innovation have been proposed (see Damanpour et al. 2009 for a review). The technological-organizational typology<sup>1</sup> is popular among management researchers and refers to a general distinction between the firm's technological and administrative systems in which the former produces changes mainly in the firm's operating system, whereas the latter mainly influences its management systems (Damanpour and Aravind 2011). Technological innovations comprise product (or service) and process innovations aiming to address customer needs, producing changes in products and production processes (Damanpour and Evan 1984; OECD 2005a). According to Damanpour and Evan (1984, p. 394), technological innovation refers to "the implementation of an idea for a new product or a new service or the introduction of new elements in an organization's production process or service operation". Organizational innovations comprise managerial and marketing innovations aiming to enhance the efficiency and effectiveness of a firm's management processes and administrative systems (Damanpour and Aravind 2011; Damanpour and Evan 1984; Birkinshaw et al. 2008; O'Cass and Weerawardena 2009). Thus, Damanpour and Aravind (2011, pp. 429–432) define organizational innovation as "new approaches in knowledge for performing the work of management and new processes that produce changes in the organization's strategy, structure, administrative procedures, and systems". While technological innovations tend to trickle up from professionals lower in the hierarchy, organizational innovations tend to trickle down from the top management (Damanpour and Evan 1984).

The relationship between innovation and environmental uncertainty has been widely discussed in the past. Innovation is seen as a means by which the organization responds to changes in the external environment or influences its environment (Baldrige and Burnham 1975; Damanpour 1996; Damanpour and

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<sup>1</sup> Technological innovation is also called 'Technical' innovation. Organizational innovation has been referred to as administrative, managerial, management, and non-technological innovation (Damanpour and Aravind 2011; Damanpour and Evan 1984; Nam et al. in press; O'Cass and Weerawardena 2009).

Evan 1984; Grønhaug and Kaufmann 1988). The question is whether innovation is an antecedent or a consequence of environmental uncertainty. Schumpeter's notion of "creative destruction" or even "creating disequilibrium in equilibrium" would suggest that uncertainty is a consequence of innovation. In that model, a high degree of innovation increases managers' perceptions of uncertainty (Freel 2005; Russell and Russell 1992). However, according to Freel (2005), "accepted wisdom now holds uncertainty as ... a cause, rather than a consequence of ... innovation" (p. 50). Accordingly, "imperfect information [i.e., uncertainties] is a circumstance constraining ... [and] introducing a new production cost, that of producing or searching for missing information" (Kirzner 1997, p. 62).

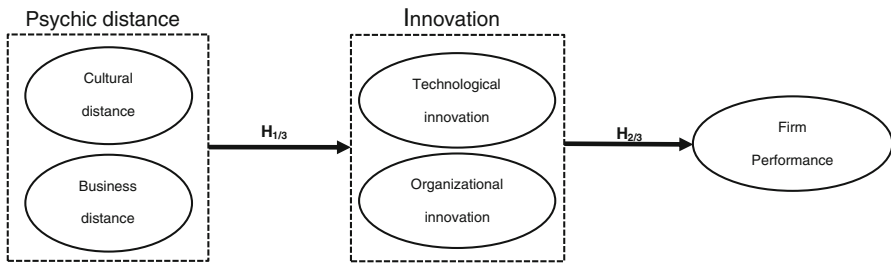
Uncertainty creates conditions in which innovators may prosper, and therefore a high level of environmental uncertainty leads to the generation of more innovation (Ettlie 1983; Freel 2005; Hrebiniak and Snow 1980; Ozsomer et al. 1997; Pierce and Delbecq 1977; Huber et al. 1993). Conversely, a low level of environmental uncertainty results in decreased innovation (Damanpour 1996). According to Damanpour and Evan (1984), innovations are means of coping with environmental uncertainties; firms adopt innovations to eliminate a performance gap caused by uncertainties in the external environment.

## 4 Conceptual Framework and Hypotheses

Building on the conceptual models of Evans and Mavondo (2002), Evans et al. (2008), Damanpour et al. (2009), Han et al. (1998), and Weerawardena (2003a, b), the framework developed in this study (Fig. 1) postulates that psychic distance has a direct relationship with innovation. Innovation in turn has a direct relationship with firm performance. Moreover, innovation has a mediating role in the relationship between psychic distance and firm performance. The model is described in more detail below.

### 4.1 Psychic Distance and Innovation

Internationalization is a process of developing business opportunities outside the domestic market (Lu and Beamish 2001), which are characterized by a high degree of uncertainty (Johanson and Vahlne 2009; Miller 1993). Uncertainty occurs when the firm perceives itself to lack sufficient market information to accurately predict the challenges of a new foreign market (Yamin and Sinkovics 2006; Penrose 1959). The source of the uncertainty in this case is the organization's external environment, so it is an environmental uncertainty (Milliken 1987). Environmental uncertainty is a perceptual phenomenon that is partly a function of characteristics of the environment in which the firm operates, so functioning in a highly complex and heterogeneous environment may increase the degree to which managers perceive uncertainty (Milliken 1987). According to Anderson and Paine (1975), applying strategies to respond to the uncertain environment is strongly influenced both by managers' perceptions of environmental uncertainty and the organization's need for change in strategic properties.



**Fig. 1** The conceptual framework

Previous research maintains that innovation is a crucial component of a firm's strategies that facilitates adaptive change to the environment and coping with environmental uncertainties (Damanpour and Evan 1984; Damanpour et al. 2009; Gunday et al. 2011). In international markets, firms compete in a more demanding, heterogeneous, and hence uncertain environment, which stimulates them to innovate in order to cope with environmental changes, overcome uncertainties, and meet market conditions (Coronado et al. 2008; López et al. 2003; Nassimbeni 2001; Giaglis and Fouskas 2011; Silva et al. 2010; Damanpour and Evan 1984). However, although international markets are generally related to more uncertainty than the domestic market, some international environments may present firms with more uncertainties than others. In particular, host markets at a larger psychic distance may constitute more uncertain environments than host markets at a lower perceived psychic distance (Evans and Mavondo 2002; Johanson and Vahlne 1977). O'Grady and Lane (1996, p. 330) argue that "cultural differences and other business difficulties in psychically distant markets increase a firm's degree of uncertainty, which presents barriers to learning about the market and operating there."

Accordingly, the perception of a high degree of environmental uncertainty when expanding into psychically distant markets triggers strategies for interacting and integrating with the market environment, by producing and adopting innovations to processes and products and to the organization's strategy, structure, and administrative procedures to cope with the new environment and overcome uncertainties (Pierce and Delbecq 1977; Russell and Russell 1992; Damanpour and Evan 1984; Damanpour et al. 2009; Armbruster et al. 2008). Therefore, our first hypothesis was:

*Hypothesis 1: Psychic distance to a host market is positively associated with adopting innovations in that market.*

#### 4.2 Innovation and Firm Performance: An Application of RBV

Innovation is a source of competitive advantage in international markets (Pla-Barber and Alegre 2007). Adopting innovations enables firms to respond quickly to changes in technologies and increasing competition in global markets and hence to act on market offers before their competitors (Zahra and Covin 1995; Gunday et al. 2011). Innovations also allow firms to gain first or early mover advantages that can lead to superior performance (Damanpour et al. 2009). According to Gunday et al.



(2011), innovations are instruments of growth strategies for firms to enter new markets, to increase existing market share and to acquire competitive advantages. Adopting innovations can eliminate a performance gap caused by uncertainties in the external environment (Damanpour et al. 2009).

In past research on the effect of innovation on firm performance, the focus has mainly been on technological rather than organizational innovations (D'Angelo 2012; Hortinha et al. 2011; Lages et al. 2009; Roper and Love 2002). This is possibly because in addition to having a more obvious association with performance, technological innovations are often more visible and less complex to implement, while organizational innovations are typically tacit in nature and difficult to observe and define. Additionally, few companies (if any) have well-established processes for continuous organizational innovations, whereas most businesses have formal methodology for technological innovations, including R&D groups that explore the frontiers of science (Mol and Birkinshaw 2009; Hamel 2006; Lam 2005; Damanpour and Evan 1984). However, having a balanced portfolio of both technological and organizational innovations is necessary for coping with changes and uncertainties in the environment and for ensuring full realization of the positive consequences of innovation on performance (Damanpour et al. 2009; Damanpour and Aravind 2011).

The positive influence of technological innovation on performance arises from the competitive advantages firms obtain through new technologies, more efficient production techniques, and new products and processes (Hall and Mairesse 1995; Kafourous et al. 2008; Zahra and Covin 1995). These innovations enable firms to respond swiftly to changes in technology and market environment in the highly competitive global market (Gunday et al. 2011; Zahra and Covin 1995). By also implementing organizational innovation as a response to environmental changes and uncertainties, firms can further improve their performance and create sustained competitive advantages (Hamel 2006).

According to RBV, bundles of rare, valuable, non-substitutable, and inimitable resources and capabilities can reduce costs, create differentiation, and obtain competitive advantages (Barney 1991; Amit and Schoemaker 1993). Therefore, it is argued that “the adoption of sets of innovations types ... would provide the organization with required capabilities and distinctive competencies to continually outperform other organizations in its population” (Damanpour et al. 2009, p. 656), whereas adoption of a single technological or organizational innovation or a set of only one of these is not sufficient to fully realize the positive consequences of innovation (Damanpour and Aravind 2011). In this regard, the complex interrelationships between technological and organizational innovations can generate valuable, distinctive and inimitable strategic assets that lead to superior performance (Camisón and Villar-López 2014). For example, in an empirical study of public service organizations in the UK, Damanpour et al. (2009) found that cumulative adoption of several innovation types enhanced organizational performance, whereas focusing on adopting a specific type of innovation (either technological or organizational) over time had a negative effect. Therefore, our second hypothesis was:

*Hypothesis 2: The cumulative adoption of innovations (technological and organizational) in a foreign market is positively associated with a firm's performance.*

#### 4.3 The Mediating Role of Innovation

The concept of psychic distance has been applied to explain firm performance when operating in international markets (Chelariu et al. 2006; Evans and Mavondo 2002; Evans et al. 2008; Hang and Godley 2009; Luo and Peng 1999; Morosini et al. 1998; O'Grady and Lane 1996; Slangen 2006; Tihanyi et al. 2005). However, the results of previous research have been inconclusive with regard to the relationship between psychic distance and firm performance (Prime et al. 2009).

Initially firms were generally assumed to perform better in psychically close markets than in psychically distant markets (Kogut and Singh 1988; Nordstrom and Vahlne 1994), possibly because of the similarity in institutional and cultural issues, ease of learning about differences, and low levels of uncertainty (Johanson and Vahlne 1977). This has been confirmed by some later empirical studies (Chelariu et al. 2006; Luo and Peng 1999; Slangen 2006), but others report that firms may obtain better performance in psychically distant markets than in close markets that are most similar to the firm's home market (Evans and Mavondo 2002; Evans et al. 2008; Hang and Godley 2009; Morosini et al. 1998; Tihanyi et al. 2005). This is known as "the psychic distance paradox" (O'Grady and Lane 1996). Several theoretical explanations have been proposed for the positive relationship between psychic distance and performance, e.g., O'Grady and Lane (1996, p. 329) suggest that "perceived similarity can lead to carelessness and failure". Thus, underestimating slight, but important, differences between the home market and a psychically close market may result in poorer performance for firms in those markets than in more distant markets (Evans and Mavondo 2002). Moreover, in psychically close markets firms may encounter stronger competition from local firms because of difficulties in establishing a clear basis for differentiation (O'Grady and Lane 1996). Furthermore, in the specific case of companies based in highly developed markets, the unique opportunities available in terms of first mover advantages and less direct competition in markets perceived as significantly different may encourage expansion into psychically distant markets (Evans and Mavondo 2002; Evans et al. 2008). Finally, in the case of cross-border acquisitions, firms in distant countries might provide companies with access to routines and repertoires which could enhance the (combined) firm's performance (Morosini et al. 1998).

Overall, however, when entering a psychically distant market, firms are likely to perceive a high level of uncertainty (O'Grady and Lane 1996; Evans and Mavondo 2002). For example, in an empirical study of retailers, Evans et al. (2008) found that firms' entry and marketing strategies mediated the relationship between psychic distance and firm performance, with firms being likely to adapt their marketing strategies to a greater extent when entering distant markets than when entering psychically closer markets. This is because the perception of greater uncertainty in distant markets may lead the firm to conduct more extensive market research and planning (Penrose 1959), which may suggest that, e.g., certain product attributes be

adapted to the export market (Evans and Bridson 2005; Evans et al. 2008). Moreover, firms may undertake obligatory adaptation in response to requirements (differences) in the new market environment (Evans et al. 2008). Adaptation of marketing strategies will provide opportunities for differentiation to satisfy all customer requirements in an export market (Cavusgil and Zou 1994; Buckley and Ghauri 2004; Calantone et al. 2004), which may enhance firm performance (Porter 2004). Perceiving greater uncertainty in distant markets may also lead to firms adopting low-cost/low-control entry mode strategies (e.g., joint ventures, strategic alliances, and franchises) (Kogut and Singh 1988), in particular to minimize the financial exposure in distant markets (Brouthers 1995; Evans et al. 2008).

A lack of sufficient information to predict challenges in a new foreign market can increase the perception of uncertainty in psychically distant markets (Yamin and Sinkovics 2006), which in turn may trigger strategies for interacting and integrating with the market environment by producing and adopting various innovations (Pierce and Delbecq 1977; Russell and Russell 1992; Damanpour and Evan 1984; Damanpour et al. 2009; Armbruster et al. 2008). The resulting competitive advantages can lead to enhanced firm performance (Damanpour and Schneider 2006; Fagerberg et al. 2005; Zahra and Covin 1995), as firms that oppose uncertainty via innovation often perform better than those which ignore its presence (Garg et al. 2003). Therefore, our third hypothesis was:

*Hypothesis 3: Adopting innovations in a foreign market mediates the relationship between psychic distance and firm performance.*

## 5 Research Methodology

### 5.1 Data Profile and Research Setting

Low-tech industries are those with no or low R&D expenditure (Hirsch-Kreinsen 2008). According to the OECD (2005b) classification of manufacturing industries, sectors with an R&D intensity below 0.9 % are classified as low-tech. On the basis of this categorization, *inter alia*, the food; paper, publishing, and print; wood and furniture; and garment industries are regarded as low-tech (OECD 2005b). On the other hand, these industries contribute a significant share of total manufacturing exports and a high share of employment and have a proven ability to innovate, giving them a vital role specifically in the developed economies of western countries (Hirsch-Kreinsen 2008). In 2000, low-tech industries accounted for about 48 % of total measured manufacturing R&D in the whole of the OECD and yet these industries are under-researched (Mendonca 2009).

Our study sample consisted of randomly selected Swedish companies in the forestry, fishing, food products, beverages, garment, and furniture industries that satisfied the following criteria: (1) exported products for at least 3 years, and (2) exported to at least two foreign markets. Sweden is well suited to the subject of the study because it is a developed country with a very small domestic market and its economy is extremely dependent on exporting into international markets. According

to the World Bank's (2012) national accounts data, about 50 % of Sweden's GDP comes from the export of goods and services to international markets. The industries chosen for the study are also appropriate, since although they are considered low-tech (OECD 2005b), a clear trend towards a more internationalized structure has been observed specifically in those industries in Sweden in the last decade (Statistics Sweden 2012).

## 5.2 Data Collection Procedure

Data collection was conducted through TNS SIFO, a recognized marketing research agency in Sweden, from February to April, 2012. A formal structured questionnaire was designed for this study and used to collect data from senior managers as key informants. We assumed that this group would be most able to provide accurate responses for the purposes of this study given their position, which allows them to review the entire organization (Glick et al. 1990).

We received 158 responses from a total of 573 companies in the population (~28 %), amounting potentially to 316 export ventures. Following Evans and Mavondo (2002) and Evans et al. (2008), the respondents were first asked to nominate two foreign markets to which their company had exported products during the previous 3 years. They were then asked to specify which of these foreign markets they perceived as "not so different" from their home market (Sweden) in terms of culture and business practices and which they perceived as "different" from Sweden. In the next stage, the respondents were asked to answer all questions for both nominated export ventures. Consistent with previous research (see e.g., Lages et al. 2007, 2009; Azar 2014a), we assumed a single export venture as the unit of analysis in this study. The complete case approach (list-wise deletion; Hair Jr. et al. 2010) was used to handle missing data. The effective responses corresponded to 186 export ventures in 23 countries (see Table 3 in Appendix for the list of export markets).

We tested for non-response bias by comparing early and late respondents (early respondents were defined as the first 75 % to return questionnaires and late as the last 25 %) for number of full-time employees, number of years of exporting, and number of export markets. The lack of significant differences between the early and late respondents suggests that response bias was not a significant problem in the study (Armstrong and Overton 1977).

In terms of characteristics of the sample, the majority of the respondents were CEOs of firms with fewer than 50 full-time employees. The majority of firms in the sample had significant international experience and had engaged in export operations for an average of 20 years ( $SD = 13.2$ , range = 2–55). The number of export markets for the firms averaged 8 ( $SD = 7.4$ , range = 2–37). Approximately 80 % of the export ventures targeted other EU countries (including Norway<sup>2</sup>), while the remainder targeted non-EU countries. Firms in the food product and furniture industries were over-represented in the sample (see Table 4 in "Appendix" for more details about the sample characteristics).

<sup>2</sup> Norway is a member of European Free Trade Association (EFTA).

### 5.3 Measures

We based our measures on the extant literature, but modified them for the study context (Churchill 1979). A list of all measured items is provided in Table 5 in Appendix.

#### 5.3.1 *Psychic Distance*

We adapted measures for the psychic distance construct from Evans and Mavondo (2002) and Evans et al. (2008). Brewer (2007, p. 61) maintain that “the measurement of a cognitive phenomenon (e.g., psychic distance) must be improved through the measurement of more rather than less of its elements”, while Evans and Mavondo (2002, p. 517) argue that “the true explanatory power of psychic distance can only be revealed when the individual elements are fully measured”. Accordingly, we measured psychic distance through 24 items of eight factors measured on two dimensions—cultural distance and business distance (see Table 5 in Appendix). Measures for cultural distance were based on Hofstede’s (1980) definitions and descriptions of four dimensions of national culture (power distance, individualism/collectivism, masculinity/femininity, and uncertainty avoidance). Business distance was measured on the dimensions of legal and political environment, economic environment, market structure, and business practices. Following Evans and Mavondo (2002) and Evans et al. (2008), we asked respondents to indicate the degree to which the foreign market was similar or different to the home market (Sweden) on a 7-point scale (1 = totally the same and 7 = totally different).

We calculated a composite index of both cultural and business distance and used it as a basis for the psychic distance construct. The index was based on Kogut and Singh’s (1988) formula for cultural distance, which is represented algebraically as:

$$CD_j = \sum \left\{ (I_{ij} - I_{is})^2 / V_i \right\} / 4$$

where  $CD_j$  or  $BD_j$  is the cultural or business difference of the  $j$ th foreign market from the home market (Sweden),  $I_{ij}$  represents the index of the  $i$ th cultural or business dimension and the  $j$ th market,  $s$  signifies the home market (Sweden), and  $V_i$  is the variance of the index of the  $i$ th dimension. We then summed these two indices to provide a composite index of psychic distance (Evans and Mavondo 2002; Evans et al. 2008).

#### 5.3.2 *Innovation*

Three typical innovation strategies can be distinguished in companies within the low-tech sector: product innovation, production process innovation, and marketing innovation (Hirsch-Kreinsen 2008). Product innovation in these industries is generally characterized as incremental improvement in the material, function, and quality of the product without departing from existing structural and technological principles (Damanpour 1996). This is particularly essential in the low-tech sector,

where the products are often more connected to customer tastes, habits, and customs, which differ from market to market (Cavusgil and Zou 1994; Cavusgil et al. 1993; Rama 2008; Azar 2011, 2014a). Production innovation typically occurs in industries with technologically mature products targeting relatively stable market segments (e.g., the food industry). Industries pursuing production process innovation are usually those with products manufactured at a high level of automation and that use integrated process technologies to optimize production (e.g., the food, forestry, and fishery industries). Marketing innovation aims to improve the firm's market position and create new markets. This strategy is most widely used with fashion- and design-oriented products that can respond rapidly to customer requirements (e.g., the garment and furniture industries) (Hirsch-Kreinsen 2008; Damanpour 1996).

Previous research in innovation has often relied on secondary data (e.g., patents) or other proxy measures (e.g., R&D intensity) to operationalize innovation (Archibugi and Planta 1996; Nam et al. 2014). However, recent research emphasizes the need for more direct measures of innovative outputs (Powell and Grodal 2005; Freeman and Soete 2009; Hervas-Oliver et al. 2011; Nam et al. 2014), not only because of shortcomings in patents and R&D intensity as measures of innovations (Freeman and Soete 2009), but also because of sectoral differences causing bias in the use of these indicators for measuring innovation (Galizzi and Venturini 2008; Hervas-Oliver et al. 2011).

The scales used for measuring innovation in the present study were based on those developed by Weerawardena (2003b, a). We asked respondents to indicate the intensity of innovation in the foreign market that the firm had undertaken in the last 3-year period on a 7-point scale (1 = limited/incremental and 7 = extensive/radical). We conceptualized the innovation construct as a reflective construct (O'Cass and Weerawardena 2009) comprising technological (product and process) and organizational (managerial and marketing) dimensions that are the manifestations of the overall construct (Jarvis et al. 2003). We operationalized innovation in terms of type (product, process, managerial, and marketing) and degree (limited-extensive; incremental-radical) to rate the intensity of a firm's innovation (O'Cass and Weerawardena 2009) (see Table 5 in Appendix). This method enabled us to utilize primary sources of data related to innovation within firms and explore their actual innovation activities. According to Nam et al. (2014), relying on primary data related to innovation facilitates a more accurate study of the phenomenon. Furthermore, compared with proxy measures for innovation (e.g., R&D intensity), this method is more appropriate for measuring innovation activities adopted by low-tech companies where R&D expenditure is very low, and hence R&D intensity would provide a misleading view (Hirsch-Kreinsen 2008).

### 5.3.3 Firm Performance

We measured firm performance through six items in two dimensions: financial performance and strategic effectiveness (Evans and Mavondo 2002; Evans et al. 2008). For financial performance, we asked respondents to indicate on a 7-point scale (1 = decrease of more than 20 % and 7 = increase of more than 20 %) the degree to which several financial indicators in the foreign market (return on assets,

return on investment, return on sales, and sales) had changed in the last three-year period. We measured strategic effectiveness by two indicators (achievement of strategic objectives and satisfaction with overall performance) using a 7-point scale (1 = very unsuccessful and 7 = very successful).

### 5.3.4 Control Variables

We used the number of full-time employees as a proxy for firm size and together with industry type entered them as control variables in all models. As a proxy for the extent of a firm's access to knowledge assets and critical resources for the innovation process, size may increase the firm's propensity to invest in innovations (Acs and Audretsch 1988). On the other hand, factors such as flexibility and fluidity of communication may bring advantages for small firms in conducting innovations (Rogers 2004; Shefer and Frenkel 2005). The relationship between firm size and innovation may also depend on the specific technological conditions of the industry (Rogers 2004; Shefer and Frenkel 2005). Previous studies (Audretsch and Acs 1991; Pla-Barber and Alegre 2007) found a positive relationship between low-tech firm size and the generation of innovative activities, while they found no evidence of such an association among high-tech firms. Kafouros et al. (2008), on the other hand, suggest that returns on innovation are not related to either firm size or industry characteristics.

We assessed the measurement model properties and analyzed the structural models using maximum likelihood estimation (MLE) with LISREL 8.8 (Jöreskog and Sörbom 2006). We assessed all measures for convergent validity by performing a confirmatory factor analysis and calculating average variance extracted (AVE) (Fornell and Larcker 1981) for all constructs (both first- and second-order) (see Table 5 in Appendix). All the AVE values were greater than 0.5, indicating convergent validity. We evaluated the second-order models for their psychometric properties and model fit, and assessed the second-order constructs for internal consistency by calculating composite reliability (CR) (Bagozzi 1980). All second-order constructs met the suggested minimum value for composite reliability (i.e., 0.7) (Nunnally 1978). We assessed individual item reliability by examining the standardized loadings of items on their corresponding construct. All items had loadings of 0.7 or more (0.5 is the minimum accepted value), which implies that all items converged on the common construct (Gerbing and Anderson 1988). We determined the corresponding Cronbach's alpha values for all of the constructs, as shown in Table 5 in Appendix. All values were greater than 0.8, indicating high reliability and consistency of the entire scale (0.6 is the lower limit for Cronbach's alpha) (Hair et al. 2010).

Following previous research (Selnes and Sallis 2003; Evans et al. 2008; Lages et al. 2009) for hypothesis testing, we aggregated the innovation and firm performance constructs by summing the measurement items. Statistical properties of the constructs are reported in Table 1.

To test for discriminant validity, we compared the AVE for the indicators of each latent construct and the square of the correlation estimate of the latent constructs (Fornell and Larcker 1981). The AVE should be greater than the squared correlation estimate, i.e., the latent construct should explain more of the variance in its item

measures that it shares with another construct (Hair et al. 2010). We conducted this test for all latent constructs in the same conceptual domains. In all cases, the AVE values (diagonal figures) were greater than the squared correlation estimate (off-diagonal figures) (Table 2).

Because all variables in this study were collected from the same respondents, we used procedural and statistical remedies as suggested by Podsakoff et al. (2003) to safeguard the findings against common method variance (CMV) (Fiske 1982). In terms of procedural remedies, (1) we used paper and pencil-administered questionnaires instead of face-to-face interviews as the medium to gather data, (2) we protected respondent anonymity to reduce evaluation apprehension, and (3) we improved scale items by defining terms used in the questionnaires and provided examples to clarify the concepts. In terms of statistical remedies, we conducted Harman's one-factor model test (Podsakoff et al. 2003), in which a worse fit for the one-factor model would suggest that CMV does not pose a serious problem. The rationale of this test is that if CMV poses a serious threat to the analysis, a single latent factor could account for all manifest variables (Podsakoff et al. 2003). The one-factor model fit statistics [ $\chi^2 = 2,236.9$  (135 *df*,  $p = 0$ ); RMSEA = 0.290; NFI = 0.5; CFI = 0.52; IFI = 0.52; RFI = 0.43; SRMR = 0.24; GFI = 0.43; and AGFI = 0.27] indicated that this model did not fit the data, suggesting that CMV is not likely to be a problem threatening the findings. Furthermore, the low correlations among the latent constructs in Table 2 indicate a low probability of CMV.

## 6 Research Findings

We used a path model (model 1, Fig. 2) to jointly test the hypotheses. We controlled for firm size and industry type. All indices indicated that the hypothesized model had an adequate fit to the data (RMSEA = 0.013; NFI = 0.96; CFI = 1.00; IFI = 1.00; RFI = 0.93; SRMR = 0.037; GFI = 0.98; AGFI = 0.95).

The path coefficient between psychic distance and innovation was positive and significant ( $t = 2.08$ ,  $p < 0.05$ ), supporting  $H_1$ , i.e., psychic distance to a host market is positively associated with adopting innovations in that market. The positive and significant path coefficient ( $t = 2.07$ ,  $p < 0.05$ ) between innovation and performance confirmed  $H_2$ , i.e., adopting cumulative innovations in a foreign market is positively associated with a firm's performance. The results also showed that the effects of control variables on innovation or firm performance were not statistically significant.

To examine the mediating role of innovation in the relationship between psychic distance and firm performance, we used the method suggested by Han et al. (1998) and Walker et al. (2011). The hypothesized model (model 1, Fig. 2) is a partially mediated model, since the effect of psychic distance on firm performance is considered both directly and indirectly through innovation (the path coefficient between psychic distance and firm performance is not significant,  $t = -0.44$ ). We proceeded with testing the mediation by subjecting the psychic distance-innovation-firm performance chain to additional confirmatory factor analysis to test the validity of a fully mediated model (model 2, Fig. 3).



**Table 1** Correlations, internal consistency, means, standard deviations, and average variance extracted

	Internal consistency	Mean	SD	1	2	3	4	5	6	7	8
1. Cultural distance	0.984	3.79	3.64	<b>0.970</b>							
2. Business distance	0.964	3.54	3.73	0.838**	<b>0.909</b>						
3. Product innovation	0.805	6.38	3.01	0.077	0.035	<b>0.826</b>					
4. Process innovation	0.866	5.14	3.06	0.150*	0.139	0.581**	<b>0.883</b>				
5. Managerial innovation	0.916	4.98	2.92	0.187*	0.106	0.455**	0.547**	<b>0.928</b>			
6. Marketing innovation	0.908	5.31	2.99	0.131	0.115	0.568**	0.548**	0.603	<b>0.913</b>		
7. Financial performance	0.924	16.27	4.85	-0.067	0.018	0.105	0.129	0.025	0.122	<b>0.882</b>	
8. Strategic effectiveness	0.909	7.29	3.00	-0.010	0.080	0.341**	0.345**	0.283	0.382**	0.636	<b>0.909</b>

Diagonal figures (in bold) are square root of the average variance extracted

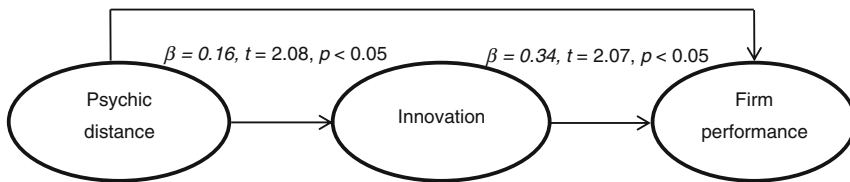
\* Correlation is significant at the 0.05 level (2-tailed)

\*\* Correlation is significant at the 0.01 level (2-tailed)

**Table 2** Correlation estimate and average variance extracted

Psychic Distance				
	1			
1. Cultural distance	<b>0.941</b>			
2. Business distance	0.846	<b>0.872</b>		
Innovation				
	1	2	3	
1. Product innovation	<b>0.683</b>			
2. Process innovation	0.462	<b>0.780</b>		
3. Managerial innovation	0.291	0.384	<b>0.862</b>	
4. Marketing innovation	0.435	0.409	0.409	<b>0.837</b>
Firm Performance				
	1			
1. Financial performance	<b>0.778</b>			
2. Strategic effectiveness	0.448	<b>0.828</b>		

Diagonal figures (in bold) are the average variance extracted; off-diagonal figures are squared correlation estimates (Fornell and Larcker 1981)

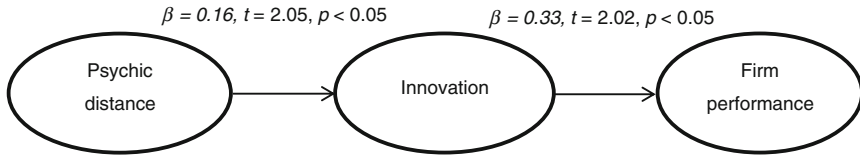


Notes:  $\chi^2 = 20.64$  (20 d.f.,  $p = 0.41886$ ); RMSEA = 0.013; NFI = 0.96; CFI = 1.00; IFI = 1.00; RFI = 0.93; SRMR = 0.037; GFI = 0.98; AGFI = 0.95. We controlled for firm size, and industry type.

**Fig. 2** Path coefficients for the hypothesized model (partial mediation)

Since models 1 and 2 are nested models, we compared the fit of the hypothesized model (model 1) and the alternative model (model 2) by the significance of change in Chi-squared and RMSEA. In model 2, the data fit well (RMSEA = 0.000; NFI = 0.96; CFI = 1.00; IFI = 1.00; RFI = 0.93; SRMR = 0.03; GFI = 0.98; AGFI = 0.95) and Chi-square was greater than that in model 1 (20.9 vs. 20.64); however, the difference between the Chi-squares was not significant ( $\Delta\chi^2[1] = 0.26$ ,  $p < 0.05$ ). Model 2 was more parsimonious than model 1 (RMSEA<sup>3</sup> = 0.000 vs. 0.013) and the difference in Chi-square was not statistically significant. Therefore, model 2 was considered better than the hypothesized model and the data indicated that the path between psychic distance and firm performance in model 1 did not represent any improvement in explaining a firm's performance. This supported H<sub>3</sub>, i.e., psychic distance affects firm performance mainly through innovation.

<sup>3</sup> Root mean square error of approximation (RMSEA) is a parsimony index. Lower RMSEA values indicate more parsimony (Zhou et al. 2007).



Notes:  $\chi^2 = 20.9$  (21 d.f.,  $p = 0.4$ ); RMSEA = 0.000; NFI = 0.96; CFI = 1.00; IFI = 0.1.00; RFI = 0.93; SRMR = 0.03; GFI = 0.98; AGFI = 0.95. We controlled for firm size, and industry type.

**Fig. 3** Path coefficients for the fully mediated model

## 7 Discussion

In international markets, firms compete in a more demanding, heterogeneous, and uncertain environment (Johanson and Vahlne 2009; Miller 1993). The cultural differences and other business difficulties in psychically distant markets increase a firm's degree of uncertainty (O'Grady and Lane 1996), and application of strategies in response to the uncertain environment is strongly influenced by managers' perceptions of environmental uncertainty (Anderson and Paine 1975). Innovation is a crucial component of such strategies (Damanpour and Evan 1984; Damanpour et al. 2009; Gunday et al. 2011), enabling firms to cope with environmental changes, overcome uncertainties, and meet market conditions (Coronado et al. 2008; López et al. 2003; Nassimbeni 2001; Giaglis and Fouskas 2011; Silva et al. 2010; Damanpour and Evan 1984). The innovations adopted by firms relate to processes and products (technological innovations), but also to organizational strategy, structure, and administrative procedures (organizational innovations) (Damanpour and Evan 1984; Damanpour et al. 2009; Armbruster et al. 2008).

This study showed that psychic distance has a positive effect on innovation, i.e., that the perception of a high level of differences and the subsequent uncertainty in psychically distant markets increases the intensity of a firm's efforts toward innovation. Firms that perceived a high level of differences in psychically distant markets proved to be more inclined to innovate (both technological and organizational innovations), presumably in order to cope with the requirements of the foreign market environment and overcome uncertainties (Silva et al. 2010; Damanpour and Evan 1984). Previous studies also cite uncertainty as a cause of innovation (Ettlie 1983; Freel 2005; Hrebiniak and Snow 1980; Ozsomer et al. 1997; Pierce and Delbecq 1977; Garg et al. 2003; Huber et al. 1993) and a driver of an organization's adaptive changes to the environment (Damanpour and Evan 1984; Damanpour et al. 2009).

The present study also showed that combined adoption of technological and organizational innovations enhanced firms' performance, confirming previous findings (Damanpour and Aravind 2011; Damanpour et al. 1989, 2009). Introducing new technologies, more efficient production techniques, and new products and processes resulting from technological innovations enables firms to respond quickly to changes in a highly competitive global market (Hall and Mairesse 1995; Kafourous et al. 2008; Zahra and Covin 1995; Gunday et al. 2011). Introducing organizational innovations improve, e.g., communication, information sharing, coordination,

learning, and innovativeness (Gunday et al. 2011; Damanpour and Evan 1984; Damanpour and Aravind 2011; OECD 2005a).

The sample analyzed in the present study consisted of firms from the low-tech sector in Sweden. Organizational innovations are specifically important for low-tech companies since they are not normally the originator of innovations based on technology (integrated process technologies), but rather users of innovations originally developed in other industries (Damanpour and Evan 1984). However, structural improvements brought about by organizational innovations lead to enhanced intra-organizational coordination and cooperation mechanisms, which in turn create an appropriate environment for the initiation and adoption of technological innovations (Gunday et al. 2011; Damanpour and Evan 1984).

Furthermore, the positive effect of innovations on firm performance observed in the present study confirms previous suggestions that innovation activities enhance a firm's performance, irrespective of its technological orientation (Thornhill 2006; Rubera and Kirca 2012).

The results showed that psychic distance has a non-significant direct effect, but a positive indirect effect through innovation, on firm performance. In other words, innovation has a mediating role in the relationship between psychic distance and firm performance. This implies that the perception of a high level of differences and the subsequent uncertainty when expanding into psychically distant markets triggers strategies for interacting and integrating with the market environment by adopting technological and organizational innovations. The subsequent competitive advantages can lead to enhanced firm performance (Damanpour and Schneider 2006; Fagerberg et al. 2005; Zahra and Covin 1995). This finding confirms the claim by Garg et al. (2003, p. 728) that "firms that confront uncertainty where it exists, via innovation, typically outperform those that ignore its presence". Moreover, it complements earlier findings by Evans et al. (2008) on the mediating role of entry and marketing strategies in the relationship between psychic distance and firm performance.

Adapting marketing strategies in response to substantial differences in psychically distant markets can provide opportunities for differentiation to satisfy all customer requirements in an export market, which may enhance firm performance (Porter 2004). Furthermore, to overcome uncertainties and minimize the financial exposure in psychically distant markets, firms may adopt entry mode strategies such as joint venture, strategic alliances, or franchises, which are associated with low costs (and low control) (Kogut and Singh 1988). Thus, psychic distance can have an indirect effect on organizational performance through the mediating roles of entry and marketing strategies (Evans et al. 2008).

In the present study, we controlled for firm size and industry type. Interestingly, the results indicated that the effects of those control variables on innovation and firm performance were not statistically significant. This indicates that regardless of size and industry type, firms innovate when expanding into psychically distant markets in which they perceive a high level of differences, and their innovations in response to the uncertain environment of a psychically distant market result in increased performance. These results are consistent with those of Shefer and Frenkel (2005) and Kafourous et al. (2008), who also found no association between firm size, industry type, propensity to innovation, and returns on innovation.

## 8 Concluding Remarks

This study examined the relationship between psychic distance, innovation, and firm performance. Psychic distance results from business managers' perception of cultural and business differences between the home market and the foreign market. Through innovation, a firm can make adaptive changes to the environment and cope with substantial differences in psychically distant markets (cf. Damanpour and Evan 1984; Damanpour et al. 2009), giving it competitive advantages. However, coping with differences and overcoming uncertainties, and hence improving performance, requires the balanced introduction of a portfolio of different types of innovations, technological and organizational.

The present study produced results that enrich the literature on international business and innovation by: (1) empirically validating the explanatory power of psychic distance in relation to innovation strategies and firm performance; (2) confirming that expansion into psychically distant markets demands synergistic use of both technological and organizational innovations to generate strategic assets that lead to superior performance; and (3) showing that innovation plays a mediating role in the relationship between psychic distance and firm performance.

The sample analyzed comprised Swedish firms from the low-tech sector, which is highly important in developed economies, contributing a significant share of exports, employment, and innovation ability. Adopting technological and organizational innovations is highly importance in this sector because its products are generally strongly associated with customer tastes, habits, and customs, which differ from market to market, and implementing product innovations allows them to meet the conditions and requirements of the new foreign market. Furthermore, the products of the low-tech sector are often manufactured at a high level of automation using integrated process technologies originally developed in other industries, so the improvements in intra-organizational coordination and cooperation mechanisms obtained by adopting organizational innovations facilitate the adoption of technological innovations in this sector.

This study relied on primary data to measure firms' innovation activities, which produced more accurate results than methods based on secondary data and proxies for innovation (e.g., R&D intensity), since the low-tech sector has a low level of R&D expenditure.

Innovation was operationalized here as a multifaceted construct encompassing both technological and organizational innovations to determine the synergistic effects of combining innovation types on performance and to compensate for the lack of previous research examining the influence of organizational innovation on firm performance. Moreover, psychic distance was operationalized as a perceptual concept comprising both cultural and business differences, since strategic decisions and organizational behavior rely on managerial perceptions of the firm's environment. Combination of these two factors enabled us to reveal the true explanatory effect of the psychic distance concept.

## 8.1 Managerial Implications

The findings of this study have several implications for international marketing managers, particularly in the low-tech sector. Entering markets that are similar to the home market often appears to be the easier choice for an expanding firm. However, this study showed that the challenges related with internationalizing into psychically distant markets may be compensated for by business opportunities arising through a firm's greater ability to differentiate itself from the competition and to access unexploited market environments. To reap the benefits of those market opportunities, the firm must make innovations to processes and products, but also to its organizational strategy, structure, and administrative procedures. Combined adoption of technological and organizational innovations is necessary so that the benefits of organizational innovations can assist in adopting other technological innovations (e.g., integrated process technologies). This is particularly important for low-tech companies, which are not normally the initial developers of technological innovations. This study showed that regardless of their size and technological level, firms that are able to adopt innovative strategies will benefit from these.

## 8.2 Limitations and Further Research

This study provided some insights into psychic distance and innovation research, but there were several limitations to the approach used. First, we assumed that uncertainty as a consequence of psychic distance would stimulate innovation, but it would be beneficial to measure uncertainty directly and add it as an additional variable in the conceptual model of the relationships between psychic distance and innovation. However, it should be noted that psychic distance has been defined and operationalized as the "degree of uncertainty about a foreign market" in past research (O'Grady and Lane 1996; Yamin and Sinkovics 2006). Furthermore, including other mediators such as entry strategy and marketing strategy in the model would provide a broader understanding of the relationship between psychic distance and firm performance. Here we used scales developed by Weerawardena (2003a, b) to measure firms' innovation activity. Although these scales have advantages in, e.g., multidimensionality, capturing direct innovation activities fitting the low tech sector, future studies should perhaps apply more comprehensive measures of both technological and organizational innovations. Additionally, a promising direction for future research would be to examine the complex interrelationships between different types of innovations and the intervening mechanisms. Moreover, the cross-sectional method applied in this study could not capture the dynamic aspects of strategy formulation in international markets and causality among constructs. Future studies should address the relationships proposed in the hypothesized model using longitudinal data to overcome such limitations and to allow for a more accurate evaluation of the causality in the relationship among psychic distance, innovation, and firm performance. An especially important consideration is the empirical possibility that the innovative capacity of the firm allows them to enter psychically distant markets. Previous research states that uncertainties in the external environment prompt innovations, but longitudinal research on this issue is still necessary and a fruitful direction for further

research following our findings. Finally, the composition of the sample may limit the generalizability of our findings, as we restricted our study to Swedish companies in low-tech industries. Future studies should replicate this investigation in other regional and industrial contexts and should also examine firms' innovation strategies when entering emerging markets, to find out whether difficulties in those markets require different types of innovations.

In conclusion, the findings suggest that the perception of a high degree of differences and subsequent uncertainty when expanding into psychically distant markets triggers strategies for interacting and integrating with the market environment. These strategies involve producing and adopting technological and organizational innovations to cope with the new environment, overcome uncertainties and ultimately improve performance. In other words, adopting innovations mediates the relationship between psychic distance and firm performance.

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## Appendix

**Table 3** Export markets covered by the study

Export markets		
Belgium	Ghana	Qatar
Bosnia and Herzegovina	Japan	Russia
China	Kuwait	South Korea
Denmark	Latvia	Spain
Estonia	Lithuania	UK
Finland	Netherlands	USA
France	Norway	Venezuela
Germany	Poland	

**Table 4** Sample characteristics

Characteristic	Percentage
Position of respondents	
• CEO	59.1
• Owner	15.6
• Marketing director	4.3
• Finance director	5.4
• Export manager	2.7
• Others	12.9
Number of employees	
• 1–49	71.5
• 50–249	19.4
• 250–499	4.3
• $\geq 500$	4.8
Number of years exporting	
• $<5$	8.1
• 5–9	10.8
• 10–14	18.3
• 15–19	9.7
• $\geq 20$	53.1
Number of foreign markets to which the firm exports	
• $<5$	6.5
• 5–9	29.6
• 10–14	28.5
• $\geq 15$	35.5
Main export market	
• Norway	28.5
• Denmark	13.4
• Finland	14.0
• Germany	7.5
• United Kingdom	5.9
• United States of America	4.3
• Russia	3.8
Industry type	
• Forestry	5.4
• Fishing	2.7
• Food products	32.8
• Beverages	7.0
• Garment	15.6
• Furniture	36.6



**Table 5** Items, reliability, and convergent validity

<b>Psychic Distance</b> (adapted from Evans and Mavondo 2002; Evans et al. 2008)	
Question: To what extent do you perceive that Sweden (the home market) is similar to or different from the nominated markets regarding each of the following statements?	
(Scale: 1 = totally the same, and 7 = totally different)	
<b>Cultural Distance</b> (second-order) (AVE = 0.941/CR = 0.984)	
[ $\chi^2 = 110.80$ (50 df, $p = 0$ ); RMSEA = 0.080; NFI = 0.98; CFI = 0.99; IFI = 0.99; RFI = 0.97; SRMR = 0.037; GFI = 0.91; and AGFI = 0.86]	
<i>Power distance</i> (AVE = 0.698/ $\alpha$ = 0.865)	0.90
CD_P1 degree of inequality among the people	0.85
CD_P2 salary range between the highest and lowest paid in organizations	0.75
CD_P3 importance of social status symbols	
<i>Individualism/collectivism</i> (AVE = 0.602/ $\alpha$ = 0.806)	
CD_I1 importance of loyalty to family and friends	0.63
CD_I2 recognition of the right to privacy	0.83
CD_I3 freedom of the press	0.85
<i>Masculinity/femininity</i> (AVE = 0.678/ $\alpha$ = 0.857)	
CD_M1 importance of caring for others	0.84
CD_M2 importance of material success	0.78
CD_M3 degree to which women are expected to be assertive and ambitious	0.85
<i>Uncertainty avoidance</i> (AVE = .640/ $\alpha$ = 0.843)	
CD_U1 Openness to change and innovation	0.78
CD_U2 tolerance of differences (i.e., religious, political, and ideological)	0.82
CD_U3 reliance on rules to govern behavior	0.80
<b>Business Distance</b> (Second-order) (AVE = 0.872/CR = 0.964)	
[ $\chi^2 = 113.94$ (51 df, $p = 0$ ); RMSEA = 0.082; NFI = 0.98; CFI = 0.99; IFI = 0.99; RFI = 0.97; SRMR = 0.039; GFI = 0.91; and AGFI = 0.86]	
<i>Legal and political environment</i> (AVE = 0.824/ $\alpha$ = 0.932)	
BD_L1 stability of political structure	0.84

Table 5 continued

BD_L2 consumer protection legislation	0.94
BD_L3 competitive practices legislation	0.94
<i>Market structure</i> (AVE = 0.673/ $\alpha$ = 0.860)	
BD_M1 physical distribution systems	0.82
BD_M2 number of competitors	0.79
BD_M3 number of large multiple chains in the market sector	0.85
<i>Economic environment</i> (AVE = 0.718/ $\alpha$ = 0.880)	
BD_E1 gross domestic product (GDP) per capita	0.85
BD_E2 capacity of the banking sector	0.89
BD_E3 level of demands for goods and service	0.80
<i>Business practices</i> (AVE = 0.649/ $\alpha$ = 0.833)	
BD_B1 terms of conditions of employment	0.81
BD_B2 credits and financial arrangements with banking institutions	0.88
BE_B3 use of contract in business dealings	0.72
<b>Innovation</b> (adapted from Weerawardena 2003a, b) (Second-order) (AVE = 0.625/CR = 0.893)	
$[\chi^2 = 53.08$ (16 <i>df</i> ; $p = 0.00,001$ ); RMSEA = 0.112; NFI = 0.97; IFI = 0.97; CFI = 0.96; GFI = 0.94; SRMR = 0.037; RFI = 0.94; and AGFI = 0.85]	
Question: How extensive/radical have been the following innovation activities your firm has undertaken in relation to the nominated markets during the last 3 years?	
(Scale: 1 = limited/incremental, and 7 = extensive/radical)	
<i>Product innovation</i> (e.g., improving existing products, creating new products) (AVE = 0.683/ $\alpha$ = 0.805)	
INN_P1 product innovations introduced by our firm during the last 3 years have been ... (scale: 1 = limited and 7 = extensive)	0.77
INN_P2 product innovations have mainly been ... (scale: 1 = incremental and 7 = radical)	0.88
<i>Process innovation</i> (e.g., introducing computer-based production application, automated material handling, introducing manufacturing information systems) (AVE = 0.780/ $\alpha$ = 0.866)	
INN_R1 process innovations introduced by our firm during the last 3 years have been ... (scale: 1 = limited and 7 = extensive)	0.80
INN_R2 process innovations have mainly been ... (scale: 1 = incremental and 7 = radical)	0.96

**Table 5** continued

<i>Managerial innovation</i> (e.g., introducing computer-based administrative applications, developing new employee rewarding schemes, obtaining new financing sources, introducing new departments or project teams) (AVE = 0.862/ $\alpha$ = 0.916)		0.84
INN_M1 Managerial innovations introduced by our firm during the last 3 years have been ... (scale: 1 = limited and 7 = extensive)		1.0
INN_M2 managerial innovations have mainly been ... (scale: 1 = incremental and 7 = radical)		
<i>Marketing innovation</i> (e.g., introducing new pricing methods, new distribution methods, new sales approaches or leasing arrangements) (AVE = 0.837/ $\alpha$ = .908)		0.90
INN_K1 marketing innovations introduced by our firm during the last 3 years have been ... (scale: 1 = limited and 7 = extensive)		0.93
INN_K2 marketing innovations have mainly been ... (scale: 1 = incremental and 7 = radical)		
<b>Firm Performance</b> (adapted from Evans and Mavondo 2002; Evans et al. 2008) (Second-order) (AVE = 0.724/CR = 0.835) [ $\chi^2$ = 37.41 (7 df, $p$ = 0); RMSEA = 0.153; NFI = 0.97; CFI = 0.98; IFI = 0.98; RFI = 0.94; SRMR = 0.074; GFI = 0.94; and AGFI = 0.81]		
<i>Financial performance</i> (AVE = 0.778/ $\alpha$ = 0.924)		
Question: To what extent have the following financial indicators changed for your company in the past 3 years in the nominated markets? (Scale: 1 = decrease of more than 20 % and 7 = increase of more than 20 %)		
PE_F1	return on assets	0.91
PE_F2	return on investment	0.92
PE_F3	return on sales	0.92
PE_F4	sales	0.77
<i>Strategic effectiveness</i> (AVE = 0.828/ $\alpha$ = 0.909)		
Question: How successful has your company been regarding the following in relation to the nominated markets in the past 3 years? (Scale: 1 = very unsuccessful and 7 = very successful)		
PE_S1	Achievement of strategic objectives	0.91
PE_S2	Satisfaction with overall performance	0.91

The values next to each item are standardized loadings

The original questionnaire was in Swedish

AVE average variance extracted (Fornell & Larcker 1981), CR construct reliability (Bagozzi 1980),  $\alpha$  Cronbach's coefficient alpha, RMSEA root mean square of approximation, NFI normed fit index, CFI comparative fit index, IFI incremental fit index, RFI relative fit index, SRMR standardized root mean residual, GFI goodness of fit index and AGFI adjusted goodness of fit index

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