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## Environmental determinants of open innovation in Dubai SMEs

Simon Pervan<sup>a,\*</sup>, Yahya Al-Ansaari<sup>b</sup>, Jun Xu<sup>c</sup>

<sup>a</sup> Swinburne Business School, Swinburne University of Technology, PO Box 218, Mail H23, Hawthorn VIC 3122, Australia

<sup>b</sup> Higher Colleges of Technology, Sharjah Colleges, P. O. Box 7947, Sharjah, United Arab Emirates

<sup>c</sup> Southern Cross University, School of Business and Tourism, Locked Mail Bag 4, Coolangatta, QLD 4225, Australia

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### ABSTRACT

This study examines a number of environmental determinants (government supported developments, financial resources, academic-industry collaborations and market dynamics) in supporting innovation in small and medium-sized enterprises in the emerging Dubai market in the United Arab Emirates. The results from a survey of 200 senior managers highlight the importance of government supported developments and market dynamics on innovation in these firms, although do not support the expected influence of financial resources and academic and industry collaborations. The implication is that innovation should be linked to the local economic development and supported by specific policies and programs.

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### 1. Introduction

The capacity to continually innovate is central to the strategy of Dubai in the United Arab Emirates (UAE) to position itself as a world hub in commerce and product and service development and it is particularly important as it looks to transition from economic growth based on hard (oil infrastructure) to soft (knowledge infrastructure) products and services (Dubai 2020 Expo, 2014). With more than 90% of firms in the Dubai manufacturing and service sectors are small and medium-sized enterprises (SMEs), it faces the challenge of encouraging innovation in firms that have traditionally been inward focused, competing fiercely but locally, with limited innovation outcomes and contributions to the local economy (DCCI, 2010; Hertog, 2010). There is no doubt that Dubai has realized its potential as a major exporter and re-exporter with ports and airports providing over 120 shipping lines and linking 85 airlines to over 130 global destinations (Dubai.ae, 2014). Foreign firms are now being encouraged to invest by the opening of the local market and the tightening of intellectual property law (Grant, Golawala, & McKechnie, 2007). Further, investment in the knowledge-based sectors has improved innovation capacity (Grant et al., 2007) and innovation is now seen as a key approach to drive competitive advantage and improve performance (Forsman & Temel, 2011).

Innovation is considered a key factor for the success of firms in the marketplace (Hult, Hurley, & Knight, 2004). It reflects the ability of the firm to seek new and better ways to identify, acquire and implement a number of tasks such as processes, products, services, systems, structures and marketing methods (Calantone, Cavusgil, & Zhao, 2002). While innovation has in the past been viewed largely as an internal function, there is now strong recognition of the importance of interactive processes among firms and with other public and private institutions (Wynarczyk, Piperopoulos, & McAdam, 2013). Previous research has focused on developed countries and their applications of open innovation to assist the flow of technology and information among key stakeholders and this concept is beginning to be explored in developing countries (Hossain, 2013).

This study asks whether environmental determinants, as part of an open innovation, support innovation in firms such as SMEs in an emerging market, namely Dubai in the UAE. Environmental determinants are those external-driven factors that can stimulate or inhibit the ability of the firm to innovate (Avlonitis & Gounaris, 1999). Researchers emphasize the importance of these external-driven factors such as government supported developments (Hadjimanolis, 1999), financial resources (Zhu, Wittmann, & Peng, 2011), academic-industry collaborations (Veugelers & Cassiman, 2005), and market dynamics (Fernandez, Del Rio, Varela, & Bande, 2010) in supporting continuous innovation to further improve an open innovation. A primary contribution of this research is to examine the efficacy of these four factors, identified as important in developed countries, in an emerging economy.

This study is organized as follows. First, we present the background and hypotheses, followed by a description of the method. A discussion of the test results and their implications are presented, followed by an

\* Corresponding author.

E-mail addresses: [spervan@swin.edu.au](mailto:spervan@swin.edu.au) (S. Pervan), [yahya.alansaari@hct.ac.ae](mailto:yahya.alansaari@hct.ac.ae) (Y. Al-Ansaari), [jun.xu@scu.edu.au](mailto:jun.xu@scu.edu.au) (J. Xu).

examination of the limitations, opportunities for future research and conclusion.

## 2. Background and hypothesis

In this section we discuss the literature of environmental determinants of government supported developments, financial resources, academic-industry collaborations and market dynamics for innovation with respect to SMEs in the emerging Dubai market. We begin with a general discussion about an open innovation and an emerging market before focusing on the environmental determinants.

### 2.1. Open innovation model

The innovation model is rapidly shifting from a manufacturer-centred to a collaborative user-centred (Von Hippel, 2006). The benefits of this shift are to gain knowledge and increase customer engagement that leads to innovation and closes the growth gaps (Selden & MacMillan, 2006). Further, the innovation model that the firm uses to compete in the 21st century has evolved from being an individual process within a firm to an interactive process between firms and institutions, that is by being more reliant on collaborative idea generation and less protective of intellectual property at the domestic and foreign levels (Wynarczyk et al., 2013), leading to innovation that is open to different individuals and firms.

The firm looks beyond its internal environment and limited resources for ideas, opportunities and partners, making use of the concept “open innovation” model (Chesbrough, 2003; Spithoven, Vanhaverbeke, & Roijakkers, 2012). The open innovation concept is defined as “the use of purposive inflows [inside] and outflow [outside] of knowledge to accelerate internal innovation and to expand the markets for external use of innovation” (Chesbrough, 2006, p.1). However, open innovation in large and small firms can differ due to their different contributions to innovation (Lee et al., 2010). It is vital therefore for small firms (Colombo, Piva, & Rossi-Lamastra, 2013) to look beyond their institutional boundaries, particularly in an emerging market (Xiaobao, Wei, & Yuzhen, 2013). Due to their resource constraints, scale limitations, limited technological assets, small innovation portfolios and market channels, small firms in particular can benefit from open innovation to reduce operating costs and to improve internal processes (Scott & Chaston, 2013). Despite this, they still implement open innovation far less than large firms (Van de Vrande, De Jong, Vanhaverbeke, & De Rochemont, 2009). Emerging markets can use the open innovation model to examine and position their national economic and social development through using innovation as a driving force to encourage innovation in the public and private sectors.

### 2.2. The emerging Dubai market and SMEs

The United Arab Emirates has been an important location for international commercial interests throughout history (UAE MFT, 2012). The UAE has a strategic position in the center of the region marked by the Gulf countries, Indian Sub-Continent, Commonwealth of Independent States and North Africa such as to allow it access to unlimited opportunities across a range of businesses and sectors (DCCI, 2010). This is complemented by infrastructure developments, logistics facilities and industry clusters. There is a considerable interest in the UAE because it is the fastest growing emerging market and the most innovation-driven economy in the Middle East and North Africa (WEF, 2010). The UAE is setting a precedent for policy progress and economic growth in the region, moving away from a reliance on the energy sector to a situation where a significant proportion of the gross domestic product will in future be sourced from non-oil revenues. Further, it has been moving toward a knowledge-based economy and is changing to a free market system that is integrating into the world economy (Grant et al., 2007; Knight, 2011). In short, the UAE has combined features of the developed and developing market economies to become a

commercial and an industrial hub in its own right (Hertog, 2010; Rettab, Brik, & Mellahi, 2009).

Of the seven states (*emirates* in Arabic) in the UAE, Dubai has been the first to implement major reforms and establish a strong presence in the business world (Grant et al., 2007; UAE MFT, 2012). The knowledge-intensity of Dubai's economic activities has grown substantially, relying on government agencies and foreign multinationals to drive innovation. This has created a significant innovation mass through many large initiatives and projects (for example Dubai Internet City, Dubai Media City and Dubai Techno Park) where firms like SMEs of similar business activities are clustered in one location to interact and innovate openly. However, the existence of the right environment for innovation at the level of the individual firm is unclear. In the local market, SMEs, as the majority of firms in the service and manufacturing sectors, make important contributions to the development of the local economy and creation of new innovations (DCCI, 2010; Massa & Testa, 2008). Policymaking to promote the development of SMEs and strengthen innovation is the responsibility of the Dubai Department of Economic Development (DDED) and the Dubai Chamber of Commerce (DCCI). To establish itself in the local market, an SME must have a minimum of 51% UAE national-ownership or a local agent (DDED, 2011). It is therefore argued that in shaping the open innovation framework, the public policies and regulations of the Dubai Government (through DDED and DCCI) should focus on removing obstacles to innovation, on facilitating the development of SMEs and on encouraging linkages and interactions between public and private institutions in an open forum (Carlsson, 2006).

### 2.3. Government supported developments and innovation

A government often devotes its resources to promote business and market environments conducive to innovation. The role of government is necessary to establish policies and incentives to improve its capacity to promote national advantage and technology development that enables firms to develop innovations and competitive advantages (Hadjimanolis, 1999; Nelson & Soete, 1988). Wonglimpiyarat (2011, p. 156) highlights that “innovation policies need to be linked to the overarching economic goals and adequately supported by specific programs to remedy market failures”. That is to say, a policy alone to promote innovation, when there is a lack of synergy between industry players, may be inappropriate and likely to fail (Mole & Worrall, 2001). Smith (1997) argues that evidence of high investments in infrastructure is linked, cross-nationally, with high growth productivity and accordingly firms are encouraged to innovate. Firms require world-class distribution networks and services, such as ports and airports, with openness to international trade similar to Dubai to ensure cost effective supply chains and reduce time to market (Furman, Porter, & Stern, 2002).

Institutional supports of sound legal and regulatory frameworks are prerequisites for firms and industries to invest in innovation and sustainable growth (Spithoven, Vanhaverbeke, & Roijakkers, 2012). Other supports are the enhancement of human capital and educational institutions for the development of new technology and the effective and efficient means of manufacturing and production (Mani, 2011). In the Dubai market, the policies, infrastructures and institutional environment such as administration authorizations, procurements and intellectual and property rights are areas developed to promote innovation within firms (Aubert, 2005; DCCI, 2010). The existing boundaries among firms need to be broken; for example, a new collaborative network of public and private institutions and industries is fortified. Such boundaries are not basically different from those to be found in developed markets but they can be more difficult to address in emerging markets. This discussion leads to our first hypothesis:

**H1.** The level of government supported developments is positively related to the level of innovation in the Dubai SME market.

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