CAPABLE BUT NOT ABLE: THE EFFECT OF INSTITUTIONAL CONTEXT AND SEARCH BREADTH ON THE ABSORPTIVE CAPACITY-CORPORATE ENTREPRENEURSHIP RELATIONSHIP

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Abstract

This study investigates how the interaction of institutional market orientation and external search breadth influence the ability to use absorptive capacity to raise the level of corporate entrepreneurship. The findings of a sample of 331 supplier companies providing products and services to the mining industry of Australia and Iran indicate that the positive association between absorptive capacity and corporate entrepreneurship is stronger for companies with greater external knowledge search breadth. Moreover, operating in a less market-oriented institutional context such as, Iran diminishes the ability to utilise a firm's absorptive capacity to raise their level of corporate entrepreneurship. Yet, firms operating in such contexts are able to overcome these disadvantages posed by their institutional context by engaging in broader external search of knowledge.

Keywords: Absorptive capacity, external knowledge search breadth, institutional market orientation, corporate entrepreneurship.

1.1 INTRODUCTION

Corporate Entrepreneurship, comprising a company's innovative, venturing and strategic renewal activities (Simsek, 2007; Zahra, 1996), is increasingly considered as a valid path to high levels of corporate performance (Yiu & Lau, 2008; Zahra, 1995), growth (Zahra, 1993; Zahra & Covin, 1995) and competitive advantage (Ireland, Covin, & Kuratko, 2009). Given these potential contributions, scholars have sought to identify organizational factors stimulating corporate entrepreneurship (Heavey, Simsek, Roche, & Kelly, 2009; Simsek & Heavey, 2011; Yiu & Lau, 2008). Recently researchers have pointed to the importance of the capability of a firm to recognise the value of external new knowledge, assimilate and exploit it for commercial purposes, which was first introduced by Cohen and Levinthal (1990) as *absorptive capacity*, in stimulating corporate entrepreneurship (Qian & Acs, 2013; Teng, 2007; Zahra, Filatotchev, & Wright, 2009). Scholars argue that one of the main challenges firms face in undertaking corporate entrepreneurship is generating *new knowledge* (Agarwal, Audretsch, & Sarkar, 2007; Teng, 2007; Zahra, et al., 2009). Indeed, corporate entrepreneurship is knowledge-intensive and relies on new knowledge for doing things differently or doing different things manifesting in the forms of innovation in products and services, processes, systems, strategies and markets (Teng, 2007). Absorptive capacity through making sense of external new knowledge and combining it in value creation processes enables firms to fill out their knowledge gaps in a timelier and more economic manner for pursing corporate entrepreneurial activities (Qian & Acs, 2013; Teng, 2007; Zahra, et al., 2009).

Effective exploitation of absorptive capacity for entrepreneurial initiatives; however, depends on the extent to which companies are exposed to external new knowledge (Audretsch & Keilbach, 2007; Qian & Acs, 2013; Zahra & George, 2002). Recently scholars have argued that contexts are heterogeneous with regards to new knowledge richness (Acs, Braunerhjelm, Audretsch, & Carlsson, 2009; Agarwal, et al., 2007) depending on their *institutional market orientation*, which is the extent to which a context adheres to free market policies (Shinkle & McCann, 2013; Zhao, 2006). Thus, the impact of absorptive capacity on corporate entrepreneurship should be subject to institutional context disparities, and companies may need context-specific mechanisms to increase their exposure to new knowledge. This raises

these questions how firms in less market-oriented institutional contexts can mitigate the baffling impacts of the institutional voids in their contexts to more effectively utilise their absorptive capacity for corporate entrepreneurship, and to what extent these mechanisms are subject to institutional contexts disparities.

This study suggests that the interaction of two factors at different levels, firm and institutional context, shapes the effect of absorptive capacity on entrepreneurial activities in companies. We first build on the prior literature and posit that absorptive capacity can stimulate corporate entrepreneurship through facilitating the transfer and utilisation of external new knowledge (Qian & Acs, 2013; Teng, 2007; Zahra, et al., 2009). We; however, argue that this positive relationship is Weaker for firms operating in a context with less institutional market orientation due to their less exposure to new external knowledge (Shinkle & McCann, 2013; Zhao, 2006). We then focus on *external knowledge search breadth* as a mechanism enabling firms to more effectively benefit from their absorptive capacity for corporate entrepreneurship. External knowledge search breadth refers to "the number of external sources or search channels that firms rely upon in their innovative activities" (Laursen & Salter, 2006, p. 134). Scholars have lately posited that a firm's exposure to new knowledge depends on how widely the firm has decided to search external knowledge or the extent to which it would like to engage external knowledge resources in its value creation processes (Chesbrough, 2007; Drechsler & Natter, 2012; Laursen & Salter, 2006). The more widely they search, the greater the chance of gaining the knowledge leading to a valuable innovation (Laursen & Salter, 2006; Leiponen & Helfat, 2010). Nevertheless, we expect that external search breadth to be more important as a booster of absorptive capacity benefits for companies in less market-oriented institutional contexts. I test our hypotheses through conducting a comparative survey in two contexts with different levels of institutional development for market functions, Australia and Iran.

Overall, this study makes at least two important contributions to the literature of corporate entrepreneurship. It first enriches the literature by showing that the impact of absorptive capacity on corporate entrepreneurship varies across institutional market orientation. This study also suggests external knowledge search breadth as a compensatory approach in the contexts with less institutional market orientation. This advances our understanding of how firms operating in less market-oriented institutional contexts can offset the voids in their institutional contexts to more effectively exploit their capabilities in entrepreneurial activities (Khanna & Palepu, 1997; Peng, 2003; Peng & Heath, 1996). This study also shows that the impact of external knowledge search breadth a booster of absorptive capacity is subject to institutional context disparities. This provides more insights into how institutional forces affect the effectiveness of organisational actions for entrepreneurial activities, which is understated in the literature (Bruton, Ahlstrom, & Obloj, 2008; Hitt, Ireland, Sirmon, & Trahms, 2011; Welter, 2011). Hitt et al., (2011), in particular, recently call future research for investigating how institutional voids like under-developed property rights in less market-oriented institutional contexts may affect decisions and actions of companies for undertaking entrepreneurial activities. This study also adds to the literature by showing how the effects of absorptive capacity and its interaction with external knowledge search breadth may be subject to institutional market orientation disparities.

1.2 THEORETICAL BACKGROUND AND HYPOTHESES

The term corporate entrepreneurship refers to entrepreneurial activities within established firms. These entrepreneurial activities entail innovation, venturing, and strategic renewal (Zahra, 1996). Innovation concerns the development of new products and services. Venturing

refers to the birth of new businesses within existing companies through expanding operations in current or new markets. Firms tend to create new ventures when opportunities in new markets are not attainable with current resources and structures or they put out of the purview of their current base businesses such as entering new technological spaces or areas (Teng, 2007; Verbeke, Chrisman, & Yuan, 2007). Strategic renewal means the redefinition of the scope of a business or significant changes in its competitive strategy, leading to new positions in the market (Sharma & Chrisman, 1999; Zahra, 1996). These activities are complementary and mutually supportive. For example, renewing the competitive approach may enhance the benefits of venturing activities, and new product development may make strategic renewal activities more beneficial (Heavey, et al., 2009; Simsek, 2007; Simsek & Heavey, 2011; Simsek, Veiga, & Lubatkin, 2007). As such, "treating individual components of corporate entrepreneurship as independent ignores their potential complementarity" (Simsek & Heavey, 2011, p. 83). It is also worth noting that corporate entrepreneurship is the actual entrepreneurial acts or the market-oriented results and differ from constructs like entrepreneurial orientation which are "predispositions of firms with respect to their strategy-making processes, practices, and activities" stimulating corporate entrepreneurship (Dess & Lumpkin, 2005; Simsek & Heavey, 2011, p. 83).

Researchers contend that a key feature of corporate entrepreneurship is its knowledge intensity or knowledge orientation (Agarwal, et al., 2007; Teng, 2007; Zahra, et al., 2009). Indeed, corporate entrepreneurship "deals with generating new know-how for doing things differently", manifesting in the forms of new products, processes and systems (Teng, 2007). New knowledge can be either developed within the internal boundaries of firms such as sustained investments in R&D activities or abstained from external resources of knowledge including suppliers, customers, research centres and competitors (Hitt, Ireland, & Lee, 2000; Zahra & Nielsen, 2002). Scholars argue that since corporate entrepreneurship mainly centres on emerging opportunities (Kuratko & Audretsch, 2009; Simsek & Heavey, 2011) and uncertainty and momentariness are integral parts of opportunities, it is not often economic or competitive for companies to only rely on internal resources for developing the new knowledge, leading corporate entrepreneurship (Agarwal, et al., 2007; Teng, 2007; Zahra, et al., 2009). As such, they need to fill out their knowledge by leveraging new knowledge from external resources and integrate them in their value creation processes to both exploit opportunities in a timely manner and reduce the high risk accompanied by developing new products, technologies and systems (Chesbrough, 2007; Laursen & Salter, 2006; Teng, 2007).

To effectively benefit from external knowledge flows; however, firms need to invest in capabilities and approaches, facilitating recognition and utilisation of external new knowledge (Cohen & Levinthal, 1990; Laursen & Salter, 2006). Yiu and Lau (2008), for example, argue that political, social and reputational capital are the capabilities helping firms in emerging economies stimulate their corporate entrepreneurship through facilitating knowledge and resources acquisition from government agencies, other companies and stakeholders. Similarly, Zahra, et al., (2009) develop a conceptual model arguing that corporate entrepreneurship require firms to gain varied knowledge from different external sources, and threshold firms, those between start up and established stages, can fulfil this requirement through investment in their absorptive capacity and forming an effective board of directors. However, to our knowledge, the association between absorptive capacity and corporate entrepreneurship has not been empirically tested. More importantly, the organisational mechanisms enabling firms more effectively benefit from their absorptive capacity for corporate entrepreneurship, particularly in the interaction of institutional contexts, have been less understood in the literature of corporate entrepreneurship (Hitt, et al., 2011; Welter,

2011). In the following sections, we discuss how and why the interaction of external search breadth and institutional market orientation may shape the effects of absorptive capacity on corporate entrepreneurship.

1.2.1 Absorptive capacity and corporate entrepreneurship

Absorptive capacity is defined by Cohen and Levinthal (1990) as a firm's capability to recognize, assimilate and exploit external new knowledge. In their seminal article, Cohen and Levinthal (1990) discuss that one strong reason why some companies are able to value, understand and apply new knowledge with less costs and efforts than others is that they have already invested in cultivating their absorptive capacity. This capability mitigates the barriers of knowledge transfer between companies such as tacitness or embeddedness (Cummings & Teng, 2003). Firms with high levels of absorptive capacity can understand external knowledge, combine it with their existing knowledge and use that for commercial ends (Zahra & George, 2002). As such, one key function of absorptive capacity is facilitating knowledge transfer which enables firms to fill out the knowledge gaps they tend to experience while pursuing corporate entrepreneurship (Teng, 2007). Through combination of external knowledge with pre-existing knowledge companies may also reach new insights providing them with different options for corporate entrepreneurship (Zahra, et al., 2009). Lane et al., (2006, p. 836) discuss that "unlike learning-by-doing which allows firms to get better at what they already do, absorptive capacity allows firms to learn to do something different." Thus, we expect that absorptive capacity to infuse external knowledge in firms' value-creation processes, fill out their knowledge gaps and create the new knowledge leading to corporate entrepreneurship. Thus, it is predicted that:

Hypothesis 1: Absorptive capacity is positively associated with corporate entrepreneurship.

1.2.2 Absorptive capacity and institutional market orientation

Institutional market orientation refers to the extent to which rules and regulations in a context adhere to free-market policies (Shinkle, Kriauciunas, & Hundley, 2013). It is measured by the level of freedom in such areas as trade, investment, financial, business operations and property rights (Kane, Holmes, & O'Grady, 2007). Institutional contexts with higher level of institutional market orientations are characterized by higher levels of "profit-driven incentive structures, rule of the law including strong intellectual property rights, regulatory frameworks that support market behaviour and high economic productivity" (Shinkle & McCann, 2013). Due to the positive effect of market-based systems on economic growth (Svejnar, 2002) or functional, political and social pressures (Oliver, 1992), economies are essentially moving toward more market oriented systems by undertaking different institutional reforms such as privatization, price and trade liberalization, development of market-oriented legal systems and banking system reform (Peng, 2003; Svejnar, 2002). However, the breadth of reforms differs across countries such that the greater an economy's institutional market orientation, the less the breadth of reforms and the resulted uncertainty in that economy (Kim, Kim, & Hoskisson, 2010; Shinkle, et al., 2013). Recently researchers have started to recognized the importance of different levels of institutional market orientation in action-output relationships. They argue that companies need different capabilities and strategies for rationally pursuing their interests in different institutional frameworks with different levels of market orientation (Lin, Peng, Yang, & Sun, 2009; Luk et al., 2008; Peng, 2003; Peng & Heath, 1996; Shinkle, et al., 2013; Shinkle & McCann, 2013). Firms in less market-oriented institutional contexts in particular endeavour to adopt approaches for offsetting their institutional voids (Khanna & Palepu, 1997; Peng, 2003; Peng & Heath, 1996).

We expect that absorptive capacity to have less of an effect on corporate entrepreneurship in a context with lower levels of institutional market orientation. Indeed, build on prior literature we discussed the possibility that absorptive capacity stimulate corporate entrepreneurship through filling knowledge gaps (Teng, 2007; Zahra, et al., 2009). we argue; however, the effect of absorptive capacity on corporate entrepreneurship depends on the extent to which firms are exposed to the external new knowledge filling their gaps or leading to corporate entrepreneurship (Audretsch & Keilbach, 2007; Qian & Acs, 2013). Scholars posit that institutional voids such as weak intellectual property rights protection and insufficient contract enforcement in less market-oriented contexts (Hoskisson, Eden, Lau, & Wright, 2000; Newman, 2000; Peng, 2003; Peng & Heath, 1996; Shinkle, et al., 2013), decreases companies' tendency to invest in developing new knowledge such as their R&D investments (Shinkle & McCann, 2013; Zhao, 2006). The institutional voids also make companies act closer and use isolating mechanisms to protect their knowledge-based discoveries (Zahra & George, 2002). As such, companies in such contexts may have less access to diverse and complementary knowledge, reducing their capacity to undertake corporate entrepreneurial activities through filling their knowledge gaps or the recombination of external knowledge (Agarwal, et al., 2007; Teng, 2007). Audretsch and Keilbach (2007) contend that contexts rich in new knowledge provide more extensive entrepreneurial opportunities for actors in the context than those poor in new knowledge. They consider entrepreneurship as a conduit of commercialising knowledge that generated by different incumbents in the context. As such, it is expected that firms in a contexts with less institutional market orientation to be less able to benefit from their absorptive capacity for corporate entrepreneurship than those in a more market oriented contexts due to their reduced access to external new knowledge and not being able to fill out their knowledge gaps. Thus, the following hypothesis can be developed:

Hypothesis 2: The level of institutional market orientation positively moderates the [positive] association between absorptive capacity and corporate entrepreneurship. Thus, we expect the effect of absorptive capacity to be more strongly positive in countries with high institutional market orientation (empirically represented by Australia) than in countries with low institutional market orientation (represented by Iran).

1.2.3 Absorptive capacity and external market knowledge search breadth

Laursen and Salter (2006, p. 134) define *external knowledge search breadth* as "the number of external sources or search channels that firms rely upon in their innovative activities". It is considered as a strategic approach, reflecting a firm's tendency for searching widely and engaging more external knowledge resources in its value creation processes (Chesbrough, 2007; Drechsler & Natter, 2012; Laursen & Salter, 2006). Laursen and Salter (2006) that gaining knowledge from different sources can be challenging for firms as approaching each of the search channels may require different corporate practices. Nevertheless, firms may miss opportunities due to lack of openness or focus only on a narrow range of sources. They suggest that companies can more effectively benefit from their absorptive capacity through adopting a search approach focusing on leveraging knowledge from diverse resources of knowledge (Grimpe & Sofka, 2009; Laursen & Salter, 2006).

Following Lauarsen and Salter's suggestion, we argue that companies can better leverage their absorptive capacity towards corporate entrepreneurship adopting an external search approach. Firstly, searching widely enhances the chance of obtaining the required knowledge for filling out knowledge gaps. Leiponen and Helfat (2010, p. 225) contend that "by accessing a greater number of knowledge sources, the firm improve the probability of abstaining knowledge that will lead to a valuable innovation output." Secondly, researchers posit that

external search breadth increases the *amount* and *variety* of knowledge entering in the process of value of creation (Leiponen & Helfat, 2010, 2011; Nieto & Santamaria, 2007). This enable firms with higher levels of absorptive capacity to undertake corporate entrepreneurship through recombination of external complementary knowledge (Kogut & Zander, 1992). Zahra et al., (2009) argue that obtaining varied knowledge from diverse source increases options for corporate entrepreneurship. As such, we expect that firms to be better able to utilise their absorptive capacity through searching widely for filling out their knowledge gaps and solving their internal problems (Teng, 2007) as well as creating new knowledge through recombination of external knowledge (Kogut & Zander, 1992). Conversely, companies with high levels of absorptive capacity which adopt a narrow search breadth may not be able to commercialise their knowledge-based discoveries due to not being able to fill out their knowledge gaps or miss many potential entrepreneurial opportunities. Thus, it is predicted that:

Hypothesis3: firms' breadth of external knowledge search positively moderates the [positive] association between absorptive capacity and corporate entrepreneurship.

1.2.4 Absorptive capacity, external search breadth and institutional market orientation

In our previous discussion we introduced two factors, shaping the effects of absorptive capacity on corporate entrepreneurship, external search breadth and institutional market orientation. we argued that adopting an external search breadth approach strengthens the association between absorptive capacity and corporate entrepreneurship; while lower levels of institutional market orientation weakens the effect of absorptive capacity on corporate entrepreneurship. In this section, we contend that firms in a context with a lower level of institutional market orientation more require external search breadth to benefit from their absorptive capacity for corporate entrepreneurship than those in a higher level of institutional market orientation.

As discussed before, institutional voids in less market-oriented contexts reduce firms' tendency to invest in creation of new knowledge or technologies (Shinkle & McCann, 2013; Zhao, 2006) and make them closer for protecting their knowledge-based discoveries (Zahra & George, 2002), reducing the exposure of other companies to new complementary knowledge. Thus, firms pursuing corporate entrepreneurship in such contexts should more widely search external sources of knowledge to acquire new knowledge or filling their gaps. The more widely a firm search, the greater the chance of gaining the knowledge filling its knowledge gaps or leading to a valuable innovation (Laursen & Salter, 2006; Leiponen & Helfat, 2010). On the other hand, firms in more market-oriented contexts have more incentives to invest in developing new knowledge and technologies (Shinkle & McCann, 2013; Zhao, 2006). As such, the pool of new knowledge in their environment reduces the necessity for searching widely to gain new knowledge and fill out their knowledge gaps (Leiponen & Helfat, 2010). Thus, it is predicted that:

Hypothesis4: There is a three-way interaction among absorptive capacity, external search breadth, and institutional market orientation. Specifically, we expect external search breadth to be more important as a booster of absorptive capacity benefits for firms in less market-oriented institutional contexts (empirically represented by Australia) than countries with high institutional market orientation (empirically represented by Australia.

1.3 METHODOLOGY

1.3.1 Sample and data collection

To test our model, a comparative study was conducted in two contexts with different institutional market orientation, Iran and Australia. The sample was supplier companies providing products and services to the Iranian and Australian mining industries. Like similar comparative studies (e.g. Lin, et al., 2009), we focused on a single industry to confine the extraneous variation of heterogeneous industry factors (Davidsson, 2008; Wales, Parida, & Patel, 2012). We also selected supplier companies in the mining industry, called Mining, , Equipment, Technology, and Service (METS) sector, because this section is mainly considered as a technologically advanced section (Bartos, 2007; Tedesco & Haseltine, 2010), and should therefore be suitable for studying absorptive capacity, which is discussed as a capability more related to assimilating and utilizing technological knowledge (Cohen & Levinthal, 1990; Tsai, 2001). Finally, we selected two distinct institutional contexts of Iran and Australia, as we investigated institutional market orientation and needed two contexts with different levels of institutional market orientation.

The first survey was conducted in Iran from mid-September to mid-November 2012. Around 800 companies were identified in Iran, using publicly available databases. Since some of the firms in our sample were not contactable, some did not exist or were irrelevant, the sample finally reduced to around 600 companies. To minimise the potential common method bias in cross-sectional studies, the questionnaire was divided into two parts, one comprised independents variables and one dependent variables, and two informants in each company were asked to fill out the questionnaires, one for independent variables and one for dependent variables (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). We eventually received completed and usable double-respondent questionnaires from 126 firms, consulting services (1.6%), contracting (18%), equipment manufacturer (63.9%), supplies and consumables (13.1%), support and services (3.3), for an effective response rate of 21%.

The second survey was conducted in December and January 2012 in Australia. A sample of around 2100 companies providing products and services to the Australian mining sector were recognised, using the same approach as used in Iran. As some of the companies turned out as irrelevant, non-existent and unreachable firms, the sample finally reduced to around 1700 companies. Following Dillman's (2000), a mixed method (triangulation) approach was used to induce participation and the companies were provided both hard copies and unique passwords for accessing to an online version of the survey. Participants were also promised to receive a management report of the project results upon completing the survey. Eventually, 205 questionnaires were returned, consulting services (19.3%), contracting (12.3%), equipment and manufacturer (24.1%), supplies and consumables (30.8%) and support and services (13.3%), for a response rate of 12%, consistent with the 10-12% typical response rate in studies targeting top executives (Hambrick, Geletkanycz, & Fredrickson, 1993).

To test the non-response bias, chi-square and t-tests on the mean differences between early and late respondents in terms of size and key variables in the model were conducted. The logic is that late respondents are assumed to be more like those not participating in a survey (Armstrong & Overton, 1977). Following Simsek, et al., (2007), we considered those returning the questionnaire after the second reminder as late respondents and before that as early respondents. No statistically significant differences were detected between early and late respondents in terms of size and key variables in the model supporting that the non-response bias was not a major issue in our study.

1.3.2 Measures

Corporate entrepreneurship: The extent to which companies pursue corporate entrepreneurial activities was measure based on Zahra'(1996) scale capturing the dimensions of *innovation*, developing new products and services, *international and local venturing*, the birth of new business within existing companies and entering new markets, *renewal*, redefining the business scope or strategy (Heavey, et al., 2009; Simsek, 2007; Simsek & Heavey, 2011; Simsek, et al., 2007). Respondents were asked to answer 15 items, rated on a five-point scale, ranging from 1 ("strongly disagree"), to 5 ("strongly agree"). Following Simsek (2007), we used corporate entrepreneurship as a meta construct, as it better captures the synergies between factors. The results of the confirmative factor analysis for measuring the measurement validity suggested reasonably good model fit (χ^2 (86) = 248.916, n = 331, $p<0.001$, $\chi^2/df = 2.89$; SRMR = .069; RMSEA = .076; CFI = .908; GFI = .911). All factor loadings were highly significant ($p < 0.001$) and the coefficient alpha for the overall scale was .83. Furthermore, a target coefficient statistic of .96 showed this higher order model effectively accounted for the relationships between the lower order individual dimensions (Marsh & Hocevar, 1985).

Absorptive capacity: Absorptive capacity was measured in this study using Lichtenthaler's (2009) scale, capturing six dimensions through three learning processes, *exploratory learning*, comprising acquisition and assimilation dimensions, *transformative learning*, encompassing maintenance and reactivation dimensions, and *exploitative learning*, capturing transmutation and exploitation dimensions, as a three-dimensional meta-construct represented by 21 items rated on a five-point scale, ranging from 1 ("strongly disagree"), to 5 ("strongly agree"). One of the items, related to the assimilation dimension, was eliminated while running factor analysis because of a low level of loading value. The results of the confirmatory factor analysis for this model suggested reasonably good model fit (χ^2 (162) = 388.800, n = 331, $p<0.001$, $\chi^2/df = 2.40$; SRMR = .053; RMSEA = .065; CFI = .917; TLI = .902). The coefficient alpha for the overall absorptive capacity scale is .90.

Institutional market orientation: Consistent with the literature (e.g. Lin, et al., 2009; Luk, et al., 2008), a dummy variable was used in this study to represent the level of market-based institutional development, where Australia was treated as an institutional setting with high level of market orientation (institutional market orientation=1) and Iran as a setting with low degree of institutional market orientation (institutional market orientation=0). The Heritage Foundation Index of Economic Freedom (Kane, et al., 2007; www.heritage.org), containing data about 50 independent variables divided into 10 categories, including business freedom, trade freedom, property rights, investment freedom, and financial freedom, has been extensively used in business or strategic management studies as a proxy to measure the strength or degree of institutional market orientation (Shinkle & Kriauciunas, 2010; Shinkle, et al., 2013). Providing updated information is an important advantage over other measures used in the literature (Meyer, Estrin, Bhaumik, & Peng, 2009). According to the 2012 Index of Economic Freedom, Iran ranks the 168th freest economy, while Australia ranks the 3th freest economy in the 2012 index. Furthermore, according to the International Monetary Fund (IFM), Iran is in the early stages of transition and moving to a more market-oriented economy (Jbili, Kramarenko, & Bailén, 2007).

External search breadth: To measure external search breadth, in align with the approach adopted by Laursen and Salter (2006) and Leiponen and Helfat (2010), seven important sources of technological knowledge in the industry, including customers, suppliers, competitors, investors, other companies, industry associations and councils, universities and

research centres, were identified and respondents were asked to answer whether they have acquired new and important knowledge about technologies from each of the sources or not, using a yes/no binary variable. They got 0 for not using and 1 for using the source. Then, their scores were summed so that the firm not gaining knowledge from any sources got 0, while one who received knowledge from all of the resources got 7.

Control variables: To control the possible confounding effects and extraneous variation, a number of variables were included in this study as control variables. As *firm size* is an important factor in explaining firm behaviour (Liao, Welsch, & Stoica, 2003) and larger companies may have more resources, but less flexibility, for corporate entrepreneurial activities (Burgers, Jansen, Van den Bosch, & Volberda, 2009), the number of full time employees, accounting for firm size, was controlled in this study. Following to the Australian Bureau of Statistics (ABS), firm size was measured through a categorical scale such that "1 to 4" was considered as micro, "5 to 19" as small, "20 to 199" as medium and "over 200" as large businesses. The literature also acknowledges that *environmental dynamism* influences corporate entrepreneurial activities (Heavey, et al., 2009). As such, environmental dynamism, capturing the rate of changes in the competitive environment, was controlled through a four-item scale, used in the literature (Jansen, Van Den Bosch, & Volberda, 2005). The coefficient alpha for this scale was .83. *Past performance* can be considered as an indication of slack in companies and influence corporate entrepreneurial activities (Bradley, Wiklund, & Shepherd, 2011; Zahra & Hayton, 2008). Thus, based on previous literature (Burgers, et al., 2009), a four-item scale was included, measuring past performance in terms of net profit, sales growth, cash growth and growth of the company's value, with a coefficient alpha of .83. Finally, additional industry effects were controlled, using five *industry* dummies: consulting services, contracting, support and services, supplies and consumables, and equipment and manufacturer.

1.3.3 Measurement validity tests

First, Harman's single factor test was conducted to test the presence of the common method bias among the whole sample. As multiple factors emerged from the solution, and the first factor did not account for the majority of the explained variance, it was less than 20%, common method bias should not be a major concern in this research (Podsakoff & Organ, 1986). Harman's test; however, is considered incomplete because the likelihood that a single-factor model fits the data is very low (Chang, van Witteloostuijn, & Eden, 2010). As such, I also followed the partial correlation procedure proposed by Lindell and Whitney (2001) to more precisely assess the method bias in the data. I added a theoretically unrelated item to the instrument as a marker variable. Since the original correlations between all significantly correlated variables remained still significant while controlling for the marker variable, the method bias does not appear to pose a major issue for the data.

To test the convergent and discriminate validity of absorptive capacity and external search breadth, the procedure recommended by Anderson and Gerbing (1988) was followed in this study. First, an unconstrained model, in which items related to each factor were loaded to their intended indicator, was tested. It resulted in a reasonably good fit (χ^2/df = 1.978; RMSEA = .054; CFI = .90; IFI = .902), providing support for convergent validity. Then, we tested a constrained model with a high correlation between the constructs to see whether the former model was significantly better than the limited one or not. Since the chi-square difference, 264, was well above 3.84, the critical chi-square value for 1 degree of freedom at p = .05, it was highly significant, supporting discriminate validity. We also ran the chi-square difference test between exploratory learning and external search breadth, and the test was

highly significant, confirming discriminate validity ($\Delta\chi^2$ (1) = 228, $p < .001$). Furthermore, following Larraneta et al., (2012), we excluded exploratory learning from the absorptive capacity construct and tested the regression model, the results were similar.

1.3.4 Analysis and results

Hierarchical regression analysis was used to test the hypotheses. Predictors, except for institutional market orientation, were both mean-centred (Cohen, Cohen, West, & Aiken, 2003). Table 1.1 (appendix A) presents the means, standard deviations and correlations of the variables in this study. Since the correlations between each pair of the variables are all below the suggested cut off of .70 (Tabachnick & Fidell 1996) and the calculated variance inflation factors (VIF) for each regression equation is well below the recommended level of 10 , multicollinearity should not bias our results. Table 1.2 (appendix A) also shows moderated regression results for corporate entrepreneurship. Model 1 tested the relationship between the control variables and corporate entrepreneurship. This model contained 3 of the 4 firm size dummies, as medium was used as the reference group and 4 of the 5 industry dummies because manufacturing was considered as the reference group. Institutional market orientation and external search breadth also entered as control variables in this model so that the unique variance explained by absorptive capacity can be examined in model 2, adding the direct effect of absorptive capacity to the first model. Model 3 included the two-way interaction of absorptive capacity and institutional market orientation as well as absorptive capacity and external search breadth, and finally model 4 tested the three-way interaction.

Model 1, containing control variables, shows that micro and large business have a positive effect on corporate entrepreneurship, indicating that larger companies have more corporate entrepreneurial activities. Environmental dynamism and past performance also significantly influence corporate entrepreneurship, but It institutional market orientation and external search breadth do not have direct effect on corporate entrepreneurship (see table 1.2). Model 2 also in table 1.2 indicates that absorptive capacity positively influences corporate entrepreneurship ($\beta = .344$, $p < .01$), providing support for hypothesis.

The interaction term of absorptive capacity and institutional market orientation in model 3 is significant ($\beta = .348$, $p < .01$), indicating that the variance explained by this two way interaction is significant (see table 1.2). To interpret the significant interaction effect, Aiken and West's (1991) plotting technique was used in which the effects of independent variable on the dependent variable in the low (one standard deviation below mean) and high (one standard deviation above mean) levels of moderator variables are depicted. In this case, low and high levels of a dummy variable, Iran versus Australia, have been used for creating the interaction plot such that Iran has been used as the reference group. As it can be seen in figure 5.1, the relationship between absorptive capacity and corporate entrepreneurship is much stronger in the more developed institutional context, Australia, and higher levels of absorptive capacity better stimulates corporate entrepreneurship in this context, indicating that hypotheses 2 is supported by the data (see figure 1.1 appendix B).

Model 3 in table 1.2 also indicates that indicating that the variance explained by the two way interaction of absorptive capacity and external search breadth is significant ($\beta = .059$, $p < .05$). The interaction plot in figure 1.2 (appendix B) shows that as absorptive capacity increases, higher levels of external search breadth lead to more corporate entrepreneurship and vice versa, supporting hypothesis 3.

With regards to hypotheses 4, the variance explained by the three-way interaction in model 4 is also marginally significant ($\beta = -.093$, $p < .10$), indicating that the variance explained by the three-way interaction is marginally significant (see table 1.2). A graphic representation of the three-way interaction needs to be created to see whether the pattern of relationships between

the variables is as predicted or not. Pursuing the approach proposed by Cohen et al., (2003) and by Aiken and West's (1991), used widely in the literature (e.g. Wiklund & Shepherd, 2005; Zhou & George, 2001), the relationships between absorptive capacity and corporate entrepreneurship at high and low levels of external search breadth and institutional market orientation (Iran versus Australia) are depicted through four plots in figure 1.3 (appendix B).

The difference between slopes were also checked following Dawson and Richter's (2006) procedure. The main purpose of this post hoc probing technique is to find out the significant three-way interaction results from significant difference between which pairs of the six combinations, created at high and low levels of the moderators, here external search breadth and institutional market orientation (Dawson & Richter, 2006).
As it can be seen in figure 1.3 and table 1.3 (appendix B), slope 2 is significantly more positive than slope 4 ($t = 2.38$, $p < .05$) , and slope 1 is significantly more positive than slope 3 ($t = 2.71$, $p < .01$), indicating that interaction effect holds across both contexts, further supporting hypothesis 3. In terms of the three-way interaction, the data suggest there is not a significant difference between the contexts when knowledge search is high, since the slope difference between slopes 1 and 2 is insignificant ($t = 1.09$, $p > .10$). This means that as long as Iranian firms use high knowledge search their absorptive capacity is just as effective in generating corporate entrepreneurship as in Australia. Yet, when knowledge search is low, Iranian firms' absorptive capacity is far less effective in generating corporate entrepreneurship than Australian firms' absorptive capacity because the slope difference between slopes 3 and 4 is also significant ($t = 2.92$, $p < .01$). These results supports hypothesis 4, suggesting than firms in a context with a lower level of institutional market orientation more require external search breadth to benefit from their absorptive capacity for corporate entrepreneurship than firms in a higher level of institutional market orientation.

1.4 DISCUSSION

The main purpose of this study was to investigate how the impact of absorptive capacity on corporate entrepreneurship might be subject to the firm's institutional market orientation and external knowledge search breadth. The findings indicate absorptive capacity is positively associated with corporate entrepreneurship, providing support for hypothesis 1. This is consistent with prior studies contending that absorptive capacity should contribute to innovative activities in companies through enriching their stocks of knowledge (Chen, Lin, & Chang, 2009; Cohen & Levinthal, 1990; McKelvie, Wiklund, & Short, 2007). These results firstly extend the corporate entrepreneurship literature through empirically testing the suggestion that absorptive capacity stimulates corporate entrepreneurship by facilitating the infusion of new knowledge within value creation processes in firms (Teng, 2007; Zahra, et al., 2009). It also adds to the literature of absorptive capacity by connecting absorptive capacity to other dimensions than innovation in products and services (Lane, Koka, & Pathak, 2006) such as business venturing and strategic renewal activities. Scholars suggests that absorptive capacity can lead to any commercial ends to which knowledge is used (Cohen & Levinthal, 1990; Zahra & George, 2002).

The results also confirm hypotheses 2 suggesting absorptive capacity has less of an effect in the contexts with less institutional market orientation. The data indicate that in the less market-oriented institutional context the relationship between absorptive capacity and corporate entrepreneurship is weaker. This supports our argument that institutional voids in the contexts with less institutional market orientation decrease firms' exposure to new knowledge. As such, absorptive capacity should be under-utilized in such contexts compared to their counterparts in more market-oriented institutional contexts. This advances the

literature of corporate entrepreneurship by showing that the impact of absorptive capacity on corporate entrepreneurship is subject to the firm's institutional market orientation (Teng, 2007; Zahra, et al., 2009). This partly responds to the call for more research on how institutional forces may shape the impact of corporate actions on entrepreneurial purposes (Hitt, et al., 2011). These results are in line with the assumption of entrepreneurship theory that contexts are also heterogeneous in entrepreneurial opportunities (Davidsson, 2004). Besides, these findings have insight for the literature of absorptive capacity. Previous studies in this literature posit the role of *task* or business environmental dynamisms in intensifying the effect of absorptive capacity on organizational outcomes (Liao, et al., 2003). I extend this literature by showing the way a firm's *institutional* market orientation affects the effectiveness of absorptive capacity for innovative purposes (Lane, et al., 2006; Santoro, Bierly Iii, & Gopalakrishnan, 2007; Volberda, Foss, & Lyles, 2010).

Regarding the moderating impact of external knowledge search breadth, the findings support hypotheses 3. Zahra et al., (2009) has lately suggested boards of directors as a complementary mechanism for more effective utilization of absorptive capacity for corporate entrepreneurship. I add to this stream by investigating the empowering effects of external search breadth on the relationship between absorptive capacity and corporate entrepreneurship. Our findings show that companies with higher levels of absorptive capacity can generate more corporate entrepreneurship through searching widely. Broader external search of knowledge is more likely to provide firms with the knowledge leading to a valuable innovation (Laursen & Salter, 2006; Leiponen & Helfat, 2010). The increased amount and diversity of knowledge supplies firms more options for entrepreneurial activities (Burt, 1992, 1997; Zahra, et al., 2009), and enhances their potential for filling out their knowledge gaps and solving their internal problems (Teng, 2007). In the literature of absorptive capacity, scholars have lately focused on organizational factors assisting firms with more effective exploitation of their absorptive capacity for corporate outcomes, and acknowledged the moderating effects of factors such as strategic orientations (Liao, et al., 2003; Wales, et al., 2012). We further extend this stream of research by empirically testing external search breadth as a mechanism for optimizing the effect of absorptive capacity on corporate entrepreneurship.

With regards to the way the interaction of external knowledge search breadth and institutional market orientation shape the effects of absorptive capacity on corporate entrepreneurship, the data provide marginally support for hypotheses 4. We suggest that external knowledge search breadth is more important as a booster of absorptive capacity benefits for firms in less market-oriented institutional contexts. The results indicate that firms in the context with low institutional market orientation, Iran, can utilise their absorptive capacity for corporate entrepreneurship as effectively as those in the more market oriented institutional context, Australia, when they search widely. However, their ability to generate corporate entrepreneurship from their absorptive capacity reduces much more than those in a more market-oriented context when they do not search widely. This supports my discussion that external knowledge search breadth can be more effective for firms operating in less market-oriented contexts to mitigate the baffling effects of institutional voids and utilise their absorptive capacity for corporate entrepreneurship. These findings advance the literatures of corporate entrepreneurship and absorptive capacity by showing the effects of organisational knowledge-gap filling mechanisms on firm outcomes vary across different levels of institutional market orientation.

Appendix A

Table **Error! No text of specified style in document.**.1 Standard deviation, and correlations [a]

		Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1.	Corporate entrepreneurship	3.39	.56	(.83)													
2.	Absorptive capacity	3.63	.52	.37**	(.90)												
3.	External search breadth	3.60	2.03	.08	.05	(.70)											
4.	Institutional market orientation [b]	.61	.48	-.008	.15**	-.38**	-										
5.	Dynamism	3.54	.64	.19**	.29**	.14**	-.06	(.83)									
6.	Past performance	3.46	.65	.34**	.25**	.03	.10^{+}	.17**	(.83)								
7.	Support and service	.09	.28	.11*	.10^{+}	-.03	.16**	.05	.10	-							
8.	Supplies and consumables	.22	.42	.04	.02	.01	.10**	-.006	.07	-.17**	-						
9.	Contracting	.13	.34	-.03	.002	.10^{+}	-.08	-.003	.04	-.12*	-.21**	-					
10.	Consulting	.12	.32	-.09	.01	-.14**	.25**	-.15**	-.08	-.11*	-.20**	-.14**	-				
11.	Manufacturing	.37	.48	-.01	-.05	.04	-.39**	.05	-.06	-.24**	-.42**	-.31**	-.28**	-			
12.	Micro	.09	.30	-.16**	-.01	-.05	.26**	-.04	-.14**	.14*	.05	-.04	.03	-.11*	-		
13.	Small	.35	.47	-.01	.02	.08	-.18**	-.05	-.13*	.07	-.04	-.02	-.005	.006	-.24**	-	
14.	Medium	.45	.49	.02	.02	-.03	-.11**	.12**	.17**	-.09^{+}	.008	.03	-.07	.13*	-.30**	-.67**	-
15.	Large	.07	.26	.14**	.10	-.008	.22**	-.05	.08	-.09^{+}	.001	.14**	.13*	-.11*	-.09^{+}	-.21**	-.26**

[a] N=331. Numbers in parentheses on the diagonal are Cronbach alphas of the composite scales.

[b] Iran context served as reference group

** Correlation is significant at the 0.0l level (2-tailed)

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

$^{+}$ Correlation is significant at the 0.10 level (2-tailed)

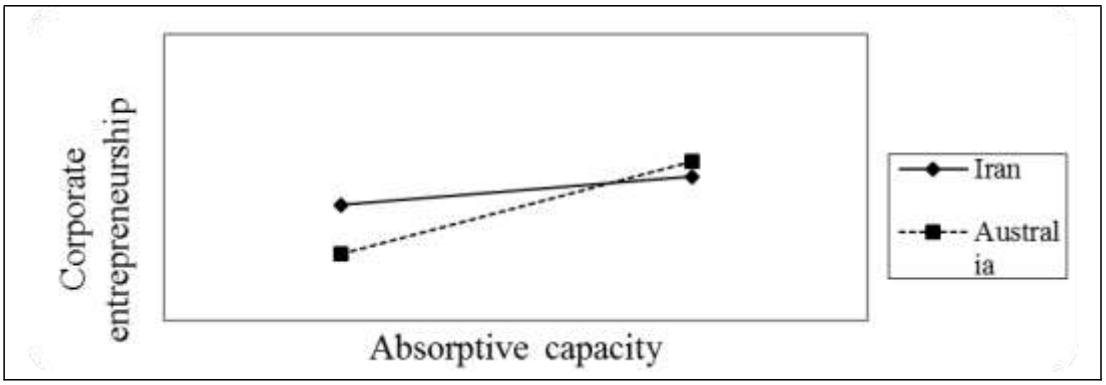
Table **Error! No text of specified style in document.**.2 Moderated regression results for corporate entrepreneurship [a]

	Model 1	Model 2	Model 3	Model 4
Control variables				
Industry dummies [b]				
- Consulting	-.084	-.103	-.089	-.120
- Contracting	-.111	-.120	-.102	-.125
- Supplies and consumables	.040	.057	.075	.063
- Support and service	.188*	.165	.137	.160
Organizational size dummies [c]				
- Micro	-.178**	-.192*	-.189*	-.197**
- Small	.070	.055	.035	.020
- Large	.350**	.360**	.343**	.373**
Environmental dynamism	.114**	.034	.020	.003
Past performance	.248***	.192***	.191***	.167***
Institutional market orientation [d]	-.040	-.091	-.096	-.063
External search breadth	.011	.016	.012	.06**
Main effect				
Absorptive Capacity		.344***	.152*	.115
Interaction effects				
Absorptive capacity * Institutional market orientation			.348**	.371**
Absorptive capacity * external search breadth			.059*	.120**
Institutional market orientation * external search breadth				-.076**
Absorptive capacity * external search breadth * Institutional market orientation				-.093*
F- Change	6.711***	36.693***	5.059**	2.674*
Adjusted R^2	.160***	.245***	.264**	.282*

[a] N=331. Unstandardized regression coefficients are displayed in the table.
*** = p<.01, ** = p < .05, * = p < .10.
[b] Manufacturing served as reference group in regression analyses.
[c] Medium size served as reference group in regression analyses.
[d] Iran context served as reference group in regression analyses.

Appendix B

Figure **Error! No text of specified style in document.**.1 Interaction of absorptive capacity and institutional market orientation



Error! No text of specified style in document..2 Interaction of absorptive capacity and external search breadth

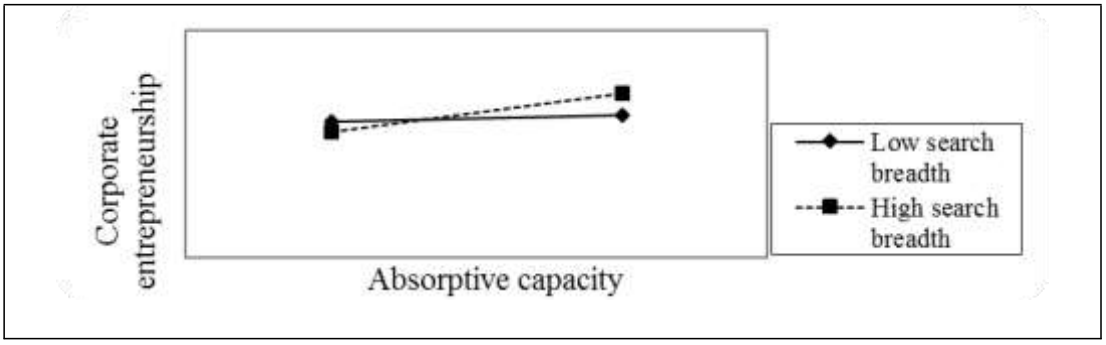
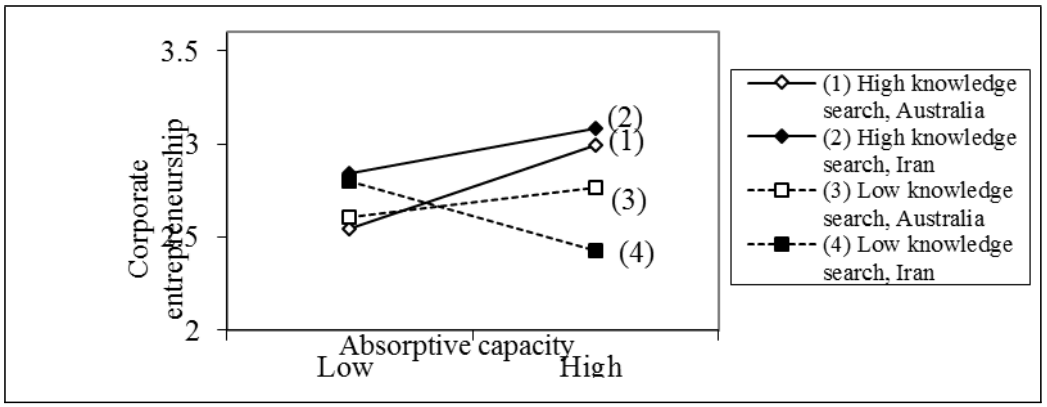


Figure **Error! No text of specified style in document.**.3 Interaction of absorptive capacity, external knowledge search breadth and institutional market orientation



Er

ror! No text of specified style in document..3 Slope difference tests

Pair of slopes	*t*-value for slope difference	*p*-value for slope difference
(1) and (2)	1.09	0.27
(1) and (3)	2.41	0.01
(1) and (4)	3.25	0.00
(2) and (3)	0.46	0.64
(2) and (4)	2.38	0.01
(3) and (4)	2.92	0.00

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