# THE ROLE OF ABSORPTIVE CAPACITY AS A MODERATING FACTOR BETWEEN ENTREPRENEURIAL ORIENTATION AND TECHNOLOGICAL INNOVATION CAPABILITIES

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Abstract-The present study purposes to examine the moderating role of absorptive capacity on its relations between entrepreneurial orientation and technological innovation capabilities among construction SMEs in Kurdistan region of Iraq. Due to the critical role of SMEs in construction industry for the reconstruction of Iraq in general and Kurdistan region in particular, the purpose is to understand, to what extent the externally generated knowledge manifested in absorptive capacity can strengthen the relation between entrepreneurial orientation and technological innovation capabilities. To validate the proposed model, self-administered questionnaire were conducted to gathering data from SMEs owners in Kurdistan region of Iraq, 249 questionnaires returned and used for statistical analysis out of 278 distributed. The outcomes of present research reflect that both of absorptive capacity and entrepreneurial orientation have significant effect on technological innovation capabilities. Furthermore, the results indicated the moderating role of absorptive capacity on the nexus between entrepreneurial orientation and technological innovation capabilities.

**Keywords**- Absorptive Capacity, Entrepreneurial Orientation, Small And Medium Industry, Technological Innovation Capabilities.

## I. INTRODUCTION

The necessity to research the absorptive capacity (ACAP) construct in privet enterprises especially SMEs and compile empirical evidence on its effects in these enterprises innovation has been vastly recognized [1]–[3]. However, former efforts to do so seem deficient for two reasons. First, while SMEs aspiration is increasingly circumspect to take advantage of externally generated knowledge, and to an extent to achieving competitive advantage, such knowledge does not quite equally uphold all enterprises, and that the priorities basked by the enterprises characterized by possession their own absorptive capacity [4].

Enterprises would be unable to rely solely on the external knowledge resources, but also have to develop their own ACAP to acquire knowledge in active way [5]. In other words, the mere existence of external knowledge does not necessarily mean to utilize it easily. Second, some aspects of SMEs innovation are constantly outward oriented owing to their close interact with customers, for example, entrepreneurial orientation (EO) in its dimension proactiveness which includes expecting and reacting to future needs of customers and market, and thus developing a first-initiative preference compared to rivals [6], to take advantage of opportunities that emerge in market place, and thus, proactiveness may be significant to EO as it indicates an advanced perspective coupled with innovative activity and taking risks [7], [8]. Over time, this leads to grows the amount of acquired knowledge, where decision-makers become steadily overloaded with various information which may negatively affects their marketing decisions in turn [9], an ACAP serves as a filtering mechanism to acquire and assimilate only the relevant and needed knowledge and then, transforming these knowledge pack into valuable outcomes [10], accordingly, the majority of SMEs are seeking to fill the internal deficit by using knowledge located external to its borders [1], [3]. The enterprise's ability to interpret and exploit knowledge is a significant factor in the access of new knowledge, while the lack of such ability can sometimes deter or undermine the SMEs' innovation capabilities [3]. Such ability improves the capability of the SME to react to customer's needs that requires risk-taking and proactive methods [8], [11], [12]. This study is expected to contribute toward technological innovation capabilities (TIC) among industrial SMEs by decreasing the potential stumbling blocks of technological innovation adoption, highlights the role of entrepreneurial orientation and external generated knowledge in addition to stimulate innovation as no one of a similar study is found before. Still, the absence of a theoretical framework that reflects the moderating role of absorptive capacity on its relation between EO and TIC forms a gap within the existing literature, and it can be depended to help industrial SMEs in their attempts to gain technological innovation and then employing it to achieve competitive advantages. In this regard, the study contributes novel evidence to extend the relevance of this key entrepreneurial orientation theory to privet enterprises management.

Entrepreneurial orientation researchers have so far neglected the implications of ACAP in their quest to gain the appropriate information to develop their TIC.

We contribute to the role of EO by addressing this overlooking.

## II. THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

Previous scholarly works have equally show the importance of firms' ability toknowledge absorptionfromoutside their borders and activate this knowledge in a proactive and innovative response to the latent customers' needs in fostering firms' innovation [13], [14]. The proposed framework, figure1., underpinned by RBV[15] which demonstrate how the firms can achieve and maintain their TIC . Based on this theory, constant maintain of competitive advantage is a result of for firm's resources and capabilities that are invaluable, scarce, imperfectly imitable, and irreplaceable [16], because a superior assortment of mixed resources assists the firm in adaptation to theconditions of uncertainty and risk that manifested in new innovations [17]. Thus, these resources and capabilities have considerable meaning to direct firm's innovation efforts [18], Which may reflect to some extent the similarity between innovation strategies in SMEs and large firms. The following figure depicts the theoretical framework of this study.

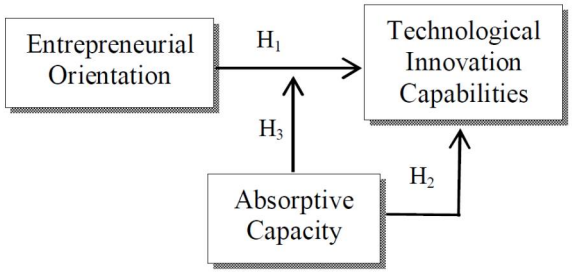



**Figure1. Theoretical framework**

### 2.1 The Relationship between EO and TIC

Firms can survive in the business environment due to the demand for their products and possess certain resources to compete with others. [19]shows that simple firm' strategies affected by its owner personality and attitudes; and indicate that those confident owners-managers of their abilities are most possible to be entrepreneurial. Based on this notion, [8] through their work characterized by promoting innovation levels in SMEs, have considered innovation as EO outcome. Empirical evidences showed that understanding entrepreneurial orientation as one of the crucial resources of the firm has a significant impact on the firm's ability to adapts to environmental changes through the provision different types of innovations [20], [21].

As indicated by the relevant literature, firm that owns an EO must be characterized with risk-taking, pro-activeness and innovativeness [19], [22]–[24] to be able to understand the requirements of both market and customers and satisfy these needs through new innovations [12], [22]. Along these lines,[25]gave an accurate depiction for the relationship that link EO with innovation, they argued that the main reason implied in this relationship represented in one of the EO dimensions which is a high grade of innovativeness. [26] and[27] have also reported that product innovation strongly related with innovativeness. Moreover, researches highlighted the role of other dimensions of EO, for instance, risk-taking can foster firm's ability to produce new products and process [28], [29]. Risk-taking nature promotes firms toward dedicate the necessary resources which help in obtaining new innovations [30], [31]. Previous studies have also indicate positive influence of proactiveness on innovation and value creation [32]. Hence, EO plays antecedent role of technological innovation capabilities[33]. This leads to the following hypothesis:

*$H_1$: Entrepreneurial orientation is related with technological innovation capabilities.*

### 2.2 The Relationship between ACAP and TIC

Enterprises try to use various mechanisms through their endeavors to acquire externally generated knowledge in order to boost their innovative levels [34], [35]. Sizable numbers of former researches have confirmed the notion that ACAP has an essential role in enhancing innovation [36]–[38].

Scholars like Scholars like[39] have assert that ACAP of the firm possesses an active role in fostering innovation in its technological form, and it can also border on the extent of value creation[38], through determining the velocity, frequency, and the amount of innovation [40]. This leads to the second hypothesis:

*$H_2$: Absorptive capacity is positively related with technological innovation capabilities.*

### 2.3 Moderation effect of absorptive capacity

Entrepreneurial Orientation represents a learning process through which enterprises acquire the relevant knowledge about customers and competitors that available outside the organizational boundaries, to inform current and future needs [8], [41]. In this meaning, entrepreneurial firm derives innovation advantages from this stream of knowledge and take proactive steps [12], [25].

As ACAP plays a critical role in supporting the learning ability which arising from a higher stock of existent knowledge in a specific field of work, then it is most likely that EO will achieve advantages from an enhanced ACAP and the relationship with innovation capabilities will achieve advantages likewise [10], [42]. However, increasing in attempts to predict the needs of customers and competitors trends will generates increasingly greater amounts of knowledge over the time, where decision-makers become steadily overloaded with various information

which may negatively affects their marketing decisions in turn [9], an ACAP serves as a filtering mechanism to acquire and assimilate only the relevant and needed knowledge and then, transforming these knowledge pack into valuable outcomes [10], which in turn may leads to an increase TIC and affect innovation levels within the firms. This leads to the following hypothesis:

*$H_3$: Absorptive capacity moderate the relation between entrepreneurial orientation and technological innovation capabilities.*

## III. METHODOLOGY

### 3.1 Research Design:

This study adopt cross-sectional design due to its ability in gathering data about specific phenomenon at a specific time, in order to support the intended model. Time dimension, on the other hand appears as a sensitive factor for present study to determine the influence of research variables on TIC.

### 3.2 Population and Sampling:

Two criteria represent the focus of attention of researchers to select the appropriate industry for present research: firstly, the industry that interested in developing of its TIC. Secondly, the industry which have a vital role in the development of other sectors and rely significantly on external knowledge to develop its activities.

Construction SMEs in Kurdistan region of Iraq (KRI) was adequate for both of adopted criteria and determined as research targeted industry. The latest copy of construction SMEs that working in KRI boundaries in 2013 has adopted for sampling purpose for this research as it includes an up to date information, helps to determine working area, the numbers of employees, the nature of industrial activity, and the amount of capital per enterprise. The population in this study is all construction SMEs that operate in the three provinces of KRI namely, Erbil, Sulaimany, and Duhok. The total number of construction SMEs is 979 for the year 2013 according to Ministry of Industrial and Trading of Kurdistan region [43]. These enterprises are different in terms of production (construction materials) and cover wide variety of industrial activities include (Bricks, Concrete Blocks, Tiles, Asphalt, Readymade Building, and gravel quarries). The target population for this research takes into consideration all these six categories to ensure the best levels of representation for the research population where disproportionate stratified random sampling has been adopted. Thus and based on[44], it is adequate to select a minimum sample of 278 from the whole research population. The questionnaires were randomly distributed to targeted SMEs owners who picked from the list of construction SMEs. Out of the chosen sample 249 were returned back and involved in statistical analysis.

## IV. STATISTICAL ANALYSIS AND RESULTS

In order to analyzing the collected data, PLS-SEM 3.0 software utilized in current study to prove the reliability and validity of measurement model before testing the proposed hypotheses, as the first step of [45] approach which includes two steps, namely; verifying the "outer model" and then examining the "inner model"by testing hypothesis depending on bootstrapping algorithm. Hypothesis testing results shown that entrepreneurial orientation has achieved significant effect on technological innovation capabilities at significance level of 0.001 ($\beta$=0.352, t= 3.085, $p<0.001$). This figures support the assumption in $H_1$ of present study, and consistent with the results of[25] study. Similarly, ACAP significantly affect TIC ($\beta$=0.287, t= 1.99, $p>0.05$), thus $H_2$ has been supported. Furthermore, the results illustrate the moderating effect of absorptive capacity on the relation between entrepreneurial orientation and technological innovation capabilities, where interaction variable introduced has significant effect ($\beta$=0.644, t= 5.072, $p<0.001$) and that support the assumption in $H_3$ of this study.

## DISCUSSION

The present study aims to broaden our perception about entrepreneurial orientation and its leverage within SMEs. Further, it analyzes the interdependencies between entrepreneurial orientation, technological innovation capabilities and ACAP. Major findings are reflected in terms of the significant effect of entrepreneurial orientation on technological innovation capabilities and the moderating effects of firms' ACAP on this relation. These figures demonstrate that both firm's entrepreneurial orientation and ACAP are not only important factors should be taken into account but also they need to be matched in order to increase firm's TIC. This study broadens ACAP research to the context of SMEs within developing economies. Thus, we have contributed to entrepreneurship literature by evidencing that ACAP serves as substantial innovation capabilities enhancing lever for young enterprises in such economies. SMEs typically possess scarce internal knowledge[1], [3] and therefore tend to rely highly on externally generated knowledge.

## IMPLICATIONS

This study has serious practical implications for searched SMEs; it provides new insights for both owners and managers to promote their firms' distinctive entrepreneurial orientation and ACAP to enhance their own TIC. The implications of this work are expected to be most obvious for construction SMEs and other industrial SMEs in which knowledge is moving ahead and innovation capabilities has been

and continues to be a significant feature for successful firms. In today's organizations, where a large volume of relevant knowledge inhabits outside a firm's boundaries, this is an important message for SMEs within developing economies, who aim to develop sustainable technological innovation capabilities, managers must realize the importance of knowledge value outside their firm's frontiers in leverage innovation capabilities, given to its significant role in learning new techniques, increasing innovativeness and proactiveness of the firm, and reducing the risk levels that associated with innovation process.

## LIMITATIONS AND FUTURE RESEARCH SUGGESTIONS

This work provide insights for entrepreneurship and innovation capabilities research, nevertheless, it has some limitations that should be highlighted. First, this study is depending on data that collected from only local construction SMEs in Kurdistan region of Iraq.[2]reported that organizational relationships especially the informal one are subject to national cultural differences effects. Thus, the ability to acquire knowledge from customers, suppliers, or other competitors might also rely on the national cultural circumference. Future work could research this topic based on a sample including enterprises from diverse national backgrounds. Second, our study concentrates exclusively on the effect of entrepreneurial orientation on technological innovation capabilities, future research have opportunity to focus on how to foster entrepreneurial orientation and examine what the antecedents for entrepreneurial orientation are. It would be interesting to distinguish between internal factors, on the one hand, for example, which leadership style or organizational culture attitudes, and the external factors, for example, competitive intensity, legislation, and the speed of changes in the desires of customers.

## REFERENCES


[1] K. Celuch and G. Murphy, "SME Internet use and strategic flexibility: the moderating effect of IT market orientation," J. Mark. Manag., vol. 26, no. 1–2, pp. 131–145, Apr. 2010.

[2] T. Flatten, G. Greve, and M. Brettel, "Absorptive Capacity and Firm Performance in SMEs: The Mediating Influence of Strategic Alliances," Eur. Manag. Rev., vol. 8, no. 3, pp. 137–152, Sep. 2011.

[3] A. Muscio, "The Impact of absorptive Capacity on SMEs' Collaboration," Econ. Innov. New Technol., vol. 16, no. 8, pp. 653–668, 2007.

[4] W. Cohen and D. Levinthal, "Absorptive Capacity : A New Perspective on Learning and Innovation Wesley M . Cohen ; Daniel A . Levinthal Absorptive Capacity : A New Perspective on Learning and Innovation," Adm. Sci. Q., vol. 35, no. 1, pp. 128–152, 1990.

[5] Wang and Y. Han, "Linking properties of knowledge with innovation performance: the moderate role of absorptive capacity," J. Knowl. Manag., vol. 15, no. 5, pp. 802–819, 2011.

[6] G. T. Lumpkin and G. G. Dess, "Clarifying the Entrepreneurial Orientation Construct and Linking It to Performance," Acad. Manag. Rev., vol. 21, no. 1, p. 135, Jan. 1996.

[7] A. Blesa and M. Ripolles, "The Role of Market Orientation in the Relationship between Entrepreneurial Proactiveness and Performance," J. Entrep., vol. 12, no. 1, pp. 1–19, Mar. 2003.

[8] Huang and Y.-L. Wang, "Entrepreneurial orientation, learning orientation, and innovation in small and medium enterprises," Procedia - Soc. Behav. Sci., vol. 24, pp. 563–570, Jan. 2011.

[9] P. E. B. Iii, F. Damanpour, and M. D. Santoro, "The Application of External Knowledge : Organizational Conditions for Exploration and Exploitation," J. Manag. Stud., vol. 46, no. May, pp. 481–509, 2009.

[10] I. R. Hodgkinson, P. Hughes, and M. Hughes, "Absorptive capacity and market orientation in public service provision," J. Strateg. Mark., vol. 20, no. 3, pp. 211–229, Jun. 2012.

[11] N. Boso, J. W. Cadogan, and V. M. Story, "Complementary effect of entrepreneurial and market orientations on export new product success under differing levels of competitive intensity and financial capital," Int. Bus. Rev., vol. 21, no. 4, pp. 667–681, Aug. 2012.

[12] N. Boso, J. W. Cadogan, and V. M. Story, "Entrepreneurial orientation and market orientation as drivers of product innovation success: A study of exporters from a developing economy," Int. Small Bus. J., vol. 31, no. 1, pp. 57–81, Mar. 2012.

[13] Otero-Neira, M. J. F. Arias, and M. T. Lindman, "Market Orientation and Entrepreneurial Proclivity: Antecedents of Innovation," Glob. Bus. Rev., vol. 14, no. 3, pp. 385–395, Sep. 2013.

[14] C. L. Wang and H. F. L. Chung, "The moderating role of managerial ties in market orientation and innovation: An Asian perspective," J. Bus. Res., vol. 66, no. 12, pp. 2431–2437, Dec. 2013.

[15] J. Barney, "Firm Resources and Sustained Competitive Advantage," J. Manage., vol. 17, no. 1, pp. 99–120, 1991.

[16] J. Barney, W. Mike, and J. Ketchen, "The resource-based view of the firm: Ten years after 1991," J. Manage., vol. 27, no. 6, pp. 625–641, Dec. 2001.

[17] M. K. Srivastava and D. R. Gnyawali, "When Do Relational Resources Matter? Leveraging Portfolio Technological Resources for Breakthrough Innovation," Acad. Manag. J., vol. 54, no. 4, pp. 797–810, Aug. 2011.

[18] Z. Zhang, H. Wu, X. Zhang, and G. Zhou, "A study of the relationship between R&D capability and innovation performance based on high-tech firms in optics valley of China," in 2009 16th International Conference on Industrial Engineering and Engineering Management, 2009, pp. 1922–1926.

[19] D. Miller, "The Correlation of Entrepreneurship in three Types of Firms," Manage. Sci., vol. 29, no. 7, pp. 770–791, 1983.

[20] J. Hong, T. H. Song, and S. Yoo, "Paths to Success: How Do Market Orientation and Entrepreneurship Orientation Produce New Product Success?," J. Prod. Innov. Manag., vol. 30, no. 1, pp. 44–55, Jan. 2013.

[21] Y. Li, Y. Zhao, J. Tan, and Y. Liu, "Moderating Effects of Entrepreneurial Orientation on Market Orientation-Performance Linkage: Evidence from Chinese Small Firms," J. Small Bus. Manag., vol. 46, no. 1, pp. 113–133, 2008.

[22] W. E. Baker and J. M. Sinkula, "The complementary Effects of Market Orientation and Entrepreneurial Orientation on Profitability in Small Businesses," J. Small Bus. Manag., vol. 47, no. 4, pp. 443–464, 2009.

[23] R. Jones and J. Rowley, "Entrepreneurial marketing in small businesses: A conceptual exploration," Int. Small Bus. J., vol. 29, no. 1, pp. 25–36, Feb. 2011.

[24] W. J. Wales, V. Parida, and P. C. Patel, "Research Notes and Commentaries Too Much of a Good Thing ? Absorptive Capacity , Firm performance , and the Moderating Role of Entrepreneurial Orientation," Strateg. Manag. J., vol. 633, no. October 2012, pp. 622–633, 2013.
[25] Atuahene-gima and Ko, "An Empirical Investigation of the Effect of Market Orientation and Entrepreneurship Orientation Alignment on Product Innovation," Organ. Sci., vol. 12, no. 1, pp. 54–74, 2001.
[26] D. H. Henard and D. M. Szymanski, "Why Some New Products Are More Successful Than Others," J. Mark. Res., vol. 37, no. August, pp. 362–75, 2001.
[27] W. E. Baker and J. M. Sinkula, "Does Market Orientation Facilitate Balanced Innovation Programs? An Organizational Learning Perspective," J. Prod. Innov. Manag., vol. 24, no. 4, pp. 316–334, Jul. 2007.
[28] Y. Chen, "Risk in integrated leapfrogging mode of technological innovation," Kybernetes, vol. 41, no. 10, pp. 1423–1439, 2012.
[29] C.-F. Cheng, M.-L. Chang, and C.-S. Li, "Configural paths to successful product innovation," J. Bus. Res., Nov. 2012.
[30] K. Z. Zhou and D. K. Tse, "The Effects of Strategic Orientations on Technology- and Market-Based," J. Mark., vol. 69, no. April, pp. 42–60, 2005.
[31] H.-T. Ko and H.-P. Lu, "Measuring innovation competencies for integrated services in the communications industry," J. Serv. Manag., vol. 21, no. 2, pp. 162–190, 2010.
[32] T. M. Zellweger, R. S. Nason, and M. Nordqvist, "From Longevity of Firms to Transgenerational Entrepreneurship of Families: Introducing Family Entrepreneurial Orientation," Fam. Bus. Rev., vol. 25, no. 2, pp. 136–155, Nov. 2011.
[33] J. Weerawardena and L. Coote, "An Empirical Investigation into Entrepreneurship and Organizational Innovation-based Competitive Strategy," J. Res. Mark. Entrep., vol. 3, no. 1, pp. 51–70, 2001.
[34] P. Jung-Erceg, K. Pandza, H. Armbruster, and C. Dreher, "Absorptive capacity in European manufacturing: a Delphi study," Ind. Manag. Data Syst., vol. 107, no. 1, pp. 37–51, 2007.
[35] C. Weigelt and M. B. Sarkar, "Performance Implication of Outsourcing for Technological Innovation: Managing the Efficiency and Adaptability trade-Off," Strateg. Manag. J., vol. 216, no. November 2009, pp. 189–216, 2012.
[36] Tsai, "Knowledge Transfer in Intraorganizational Networks : Effects of Network Position and Absorptive Capacity on Business Unit Innovation and Performance," Acad. Manag. J., vol. 44, no. 5, pp. 996–1004, 2001.
[37] S. Laforet, "A framework of organisational innovation and outcomes in SMEs," Int. J. Entrep. Behav. Res., vol. 17, no. 4, pp. 380–408, 2011.
[38] P. Hurmelinna-Laukkanen, "Constituents and outcomes of absorptive capacity – appropriability regime changing the game," Manag. Decis., vol. 50, no. 7, pp. 1178–1199, 2012.
[39] M. D. C. Caccia-Bava, T. Guimaraes, and S. J. Harrington, "Hospital organization culture, capacity to innovate and success in technology adoption," J. Heal. Organ. Manag., vol. 20, no. 3, pp. 194–217, 2006.
[40] C.-Y. Tseng, D. C. Pai, and C.-H. Hung, "Knowledge absorptive capacity and innovation performance in KIBS," J. Knowl. Manag., vol. 15, no. 6, pp. 971–983, 2011.
[41] M. Hughes, P. Hughes, and R. E. Morgan, "Exploitative Learning and Entrepreneurial Orientation Alignment in Emerging Young Firms: Implications for Market and Response Performance," Br. J. Manag., vol. 18, no. 4, pp. 359–375, Dec. 2007.
[42] Liao, W.-C. Fei, and C.-C. Chen, "Knowledge sharing, absorptive capacity, and innovation capability: an empirical study of Taiwan's knowledge-intensive industries," J. Inf. Sci., vol. 33, no. 3, pp. 340–359, Mar. 2007.
[43] MTIKRG, "Industrial Factories Directory." Ministry of Trade and Industry Kurdistan Region of Iraq, Kurdistan Region of Iraq - Erbil, 2013.
[44] R. V Krejcie and D. W. Morgan, "Determining Sample Size for Research Activities," Educ. Psychol. Meas., vol. 38, pp. 607–610, 1970.
[45] W. Chin, The partial least squares approach to structural equation modeling, In G. A. M. Modern methods for business research, 1998.

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