ENTREPRENEURIAL ORIENTATION, ABSORPTIVE CAPACITY, MARKET ORIENTATION AND TECHNOLOGICAL INNOVATION CAPABILITIES OF SMES IN KURDISTAN, IRAQ

By

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By

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ABSTRACT

Innovation capabilities have become an important component for small and medium enterprises (SMEs) in the industrial sector to cope with intense competition and to meet customers' needs. Due to inconsistency in the findings of previous studies on the antecedent factors that may influence these capabilities, this study intended to empirically examine the relationships between entrepreneurial orientation, absorptive capacity, market orientation, and technological innovation capabilities among the industrial SMEs in an unstable environment, and also to determine whether market orientation has a mediating role in the relationship between entrepreneurial orientation, absorptive capacity, and technological innovation capabilities . This study adopted the Resource-Based Theory as an underpinning theory for its assumptions and to develop its model. Self-administered questionnaires were distributed to the industrial SMEs owners in the Kurdistan region of Iraq. A total of 432 innovative enterprises were involved in this study, making an overall 63.9% response rate. This study utilized the partial least squares structural equation modelling (PLS-SEM) to establish the validity and reliability of the measurement model and to test the relationships. The outcomes of this study show that both absorptive capacity and entrepreneurial orientation have significant influences on technological innovation capabilities. Furthermore, the results indicate that market orientation has a partial mediating role in the nexus between absorptive capacity and technological innovation capabilities, but it has not been found to mediate the relationship between entrepreneurial orientation and technological innovation capabilities. This study offers theoretical and practical contributions for academics and professionals. The limitations of the study have been addressed and some valuable suggestions for future research work are offered.

Keywords: absorptive capacity, entrepreneurial orientation, market orientation, technological innovation capabilities.

ABSTRAK

Keupayaan inovasi telah menjadi satu komponen penting bagi industri kecil dan sederhana (IKS) dalam sektor industri untuk menghadapi persaingan sengit dan memenuhi keperluan pelanggan. Oleh kerana dapatan kajian terdahulu mengenai faktor-faktor yang boleh mempengaruhi keupayaan-keupayaan ini didapati tidak konsisten, maka kajian ini cuba untuk mengkaji secara empirikal hubungan antara orientasi keusahawanan, kemampuan untuk menyerap, orientasi pasaran, dan keupayaan inovasi teknologi bagi industri IKS dalam persekitaran yang tidak stabil. Selain itu, kajian ini juga bertujuan untuk menentukan sama ada orientasi pasaran memainkan peranan sebagai perantara dalam hubungan antara orientasi keusahawanan, kemampuan untuk menyerap, dan keupayaan inovasi teknologi. Kajian ini menggunakan teori berasaskan sumber sebagai teori yang menjadi asas bagi andaian dan asas untuk membangunkan modelnya. Soal selidik tadbir kendiri telah diedarkan kepada pemilik industri IKS di wilayah Kurdistan, Iraq. Sebanyak 432 buah syarikat inovatif terlibat dalam kajian ini, menjadikan kadar tindak balas secara keseluruhannya sebanyak 63.9%. Kajian ini menggunakan pemodelan persamaan terkecil berstruktur (PLS-SEM) bagi mewujudkan kesahan dan kebolehpercayaan pengukuran model dan untuk menguji hubungan-hubungan tersebut. Hasil kajian ini menunjukkan bahawa kemampuan untuk menyerap dan orientasi keusahawanan mempunyai pengaruh yang besar ke atas keupayaan inovasi teknologi. Tambahan pula, keputusan menunjukkan bahawa orientasi pasaran memainkan peranan sebagai perantara separa dalam pertalian antara kemampuan untuk menyerap dan keupayaan inovasi teknologi, tetapi tidak menjadi perantara bagi hubungan antara orientasi keusahawanan dan keupayaan inovasi teknologi. Kajian ini memberikan sumbangan dalam bidang teori dan praktikal kepada ahli akademik dan profesional. Batasan bagi kajian ini telah ditangani dan beberapa cadangan yang bernilai bagi kajian akan datang turut dikemukakan.

Kata kunci: kemampuan menyerap, orientasi keusahawanan, orientasi pasaran, keupayaan inovasi teknologi.

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LIST OF ABBREVIATIONS

ACAP	Absorptive Capacity
CIPE	Center for International Private Enterprises
EO	Entrepreneurial Orientation
GDP	Gross Domestic Product
KFCCI	Kurdistan Federation Chamber of commerce and Industry/ Iraq
KRG	Kurdistan Region Government
MO	Market Orientation
NPD	New Product Development
PRDI	Product Innovation
PRSI	Process Innovation
RBV	Resource-Based View
SIGIR	Special Inspector General for Iraq Reconstruction
SMEs	Small and Medium Enterprises
TI	Technological Innovation
USAID	U.S. Agency for International Development

CHAPTER ONE

INTRODUCTION

1.1 Research Background

It is well known that the industrial sector usually develops faster than other economic sectors, due to the distinctive capability of industries to embrace technological and manufacturing innovations and modern management methods, in addition to their orientation towards production specialization in various fields. Hence, industrial enterprises play a vital role because they overlap with other sectors and have great opportunities to contribute to a larger portion of the gross domestic product (GDP) (Bakar & Ahmad, 2010; Pullen, de Weerd-Nederhof, Groen, & Fisscher, 2012).

The private industrial sector, especially Small and Medium Enterprises (SMEs), plays a focal role to achieve noticeable economic leaps and high income levels, which can be sustained for the long-term through production and exportation activities (González-Loureiro & Pita-Castelo, 2013; Westerberg & Frishammar, 2012). Additionally, SMEs serve as an efficient way to bring about the new technologies that contribute to developing and integrating all other economic sectors (Guo & Shi, 2012).

Since 2007, a growing interest in the industrial SMEs has been emerging in the Kurdistan region of Iraq, particularly, to move the industry wheel and solve the problem of unemployment (Batal, Alrawy & Ali, 2011). Nevertheless, there are

no clear plans to develop this sector and the most important characteristic of this sector is the lack of sufficient governmental and private investment that can help to develop it. According to the Center for International Private Enterprises (CIPE), the industrial sector in the Kurdistan region is weak compared to other sectors (CIPE, 2007).

This may be attributed to many reasons: (i) low scientific level of agencies and government institutions that manage industrial activities. This is illustrated by the percentage of university degree holders of about 7.60 percent in 2007, while the primary certificate holders made up 52.57 percent . The private sector also faces a deficiency of qualified staff which results in the decline of workers' productivity in the industrial sector in the Kurdistan region; (ii) industrial SMEs in the Kurdistan region suffer from poor managerial practices and manpower turnover (Ali, 2013). Further, the administration within these enterprises is still mostly family-run, where the administration is typically characterized by lack of modern management skills. There is also the absence of studies that determine the domestic and overseas market requirements in addition to weak marketing practices (Ali, 2013); (iii) continuous wars have led to the collapse of the economic structure, which in turn has led to directing the local market towards foreign goods (Tas, 2012). In this context, and according to the Special Inspector-General for Iraq's Reconstruction (SIGIR), foreign commercial activity jumped 40 percent to nearly $56 billion in 2011 compared to the past periods (Bowen, 2012).

Certainly, this has reflected negatively on the local industry and this seems more obvious in the Kurdistan region, which is the "northern gateway to Iraq". The region relies heavily on imported goods, including food and medical, manufactured and construction goods, as declared by the Kurdistan Region Government's (KRG) official estimates (Bowen, 2011). This is due to the prominent role of the service sector; added to the unavailability of a developed and flexible industrial sector. Therefore, the inability of local products to meet the domestic demand increases the amount of imported goods.

The private industrial sector, especially SMEs, has been experiencing a great deficiency in expertise at different levels. Despite the external support from some countries, like the United States, still some SMEs operating in the health, agricultural and banking sectors have priority (USAID, 2011). Further, the local market depends almost entirely on imported goods, for example, the largest share of approximately 44.4 percent of Jordanian exports go to the Iraqi market (Al-Hyari, Al-Weshah, & Alnsour, 2012), in addition to imports from other neighboring countries, such as Iran, Turkey and others countries as well. Based on the Erbil Chamber of Commerce, the imports in 2011 totaled USD 45,102,360 billion. This amount increased to USD 60,338,560 billion in 2012; these figures are the result of Kurdistan's local market needs and the abundance of more than 3,136 local and foreign trading companies (KFCCI, 2012).

Perhaps the lack of specific resources represents one of the main reasons for the low level of technological innovation capabilities (TIC) in industrial SMEs in the Kurdistan region of Iraq. This is due mainly to the fact that all of Iraq and the Kurdistan region in particular, has suffered many wars that has led to deficiency in the level of firms' capabilities and resources (Bowen, 2012; Tas, 2012), especially the level of human capabilities (Klomp, 2011). However, firms do not achieve innovation depending only on their resources but also on their competencies which allow the best use of such resources (Bakar & Ahmad, 2010), and that explains the dependence of firms' success on their competencies more than resources itself (Camisón & Villar-López, 2012b; Ritter & Gemünden, 2004).

It could be argued that the pillars of the Resource-Based View (RBV) assert that the firm's resources and capabilities are the fundamental determinants of innovation and competitive advantage (Bhamra, Dani, & Bhamra, 2011; Martín-de Castro, Delgado-Verde, Navas-López, & Cruz-González, 2013). Thus, resource-based scholars have focused more precisely on the dynamic capabilities, investigating how capabilities and resources develop inside the firms over time (Danneels, 2002); they have focused their efforts on the internal capabilities which provide the firm with sustained superior advantages and values over competitors and consider it as core competencies (Clardy, 2008). Under such a perspective, not all resources are essential to achieve superiority over competitors.

Boguslauskas and Kvedaraviciene (2009); and Martín-de Castro et al., (2013) argued that the indispensable resources to achieve competitive advantage and innovation must meet two objectives: first, to offer the greatest value to the end customer; and second, to ensure the highest level of productivity for the firm itself - in the other words, to offer significant distinctive advantage over other competitors (Yozgat, Şişman, & Gemlik, 2012).

While the RBV encompasses a broad field, including tangible and intangible resources, this research is interested in only the intangible resources of the firm based on previous studies (Galbreath, 2005; Huang, Lai, & Lin, 2011; Martín-de Castro et al., 2013) which have posited that intassngible resources contribute more effectively to a firm's prosperity and success than tangible resources. Thus, following Anca and Cruceru (2012); Boso, Cadogan, and Story (2012a); Flatten, Greve, and Brettel (2011); Jiménez-Jimenez, Valle, and Hernandez-Espallardo (2008); Ko and Lu (2010); Smith (2008); and Yozgat et al., (2012) this research tries to study the factors that are believed to have a greater impact on TIC in industrial SMEs in the Kurdistan region through the following resources: Entrepreneurial Orientation (EO); Absorptive Capacity (ACAP); and Market Orientation (MO). Although numerous studies have confirmed the role of resources on innovation, a complete understanding of the role of some of these resources on technological innovation, specifically, is still incomplete up to now (Ar & Baki, 2011; Bigliardi & Dormio, 2009; Carmen & José, 2008; Wales, Parida, & Patel, 2013). Little is known concerning the effects of entrepreneurial and market orientations on technological innovation (Boso,

Cadogan, & Story, 2012b; Jones & Rowley, 2011; Morris, Coombes, Schindehutte, & Allen, 2007); and what is the combined effect of these two resources on technological innovation (Blesa & Ripolles, 2003; Boso et al., 2012a; Weigelt & Sarkar, 2012). As such, previous academic efforts have called for more empirical efforts within this area (Baker & Sinkula, 2009; Boso et al., 2012a; Li, Zhao, Tan, & Liu, 2008; Otero-Neira, Arias, & Lindman, 2013; Renko, Alan, & Brännback, 2009).

In the context of absorptive capacity (ACAP), Camisón and Forés (2010) confirmed that ACAP is a dynamic capacity that allows firms to make valuable products and collect knowledge about new markets. But a full understanding of the combined effect of ACAP and market orientation (MO) is still ambiguous. Due to the lack of studies that shed light on this relationship, earlier studies have suggested clarifying this relationship more precisely and empirically (Cambra-Fierro, Hart, Polo-Redondo, & Fuster-Mur, 2011; Chang, Gong, Way, & Jia, 2013; Hodgkinson, Hughes, & Hughes, 2012).

Several studies have proven the fact that SMEs often do not focus sufficiently on knowledge obtained from the market but depend heavily on intuition when estimating both of market and customers' potential needs (Raju, Lonial, & Crum, 2011; Williams, 2003). Previous researches have also claimed that MO has a focal role in achieving superior business performance and competitive advantage over other competitors (Carmen & José, 2008; Zebal & Goodwin, 2012).

Along similar lines, Lin, Peng, and Kao, (2008) illustrated that market knowledge represents an external drive to facilitate innovation. Gaur, Vasudevan, and Gaur, (2011) reported that the innovation of new products is partly driven by other competitors' innovations and partly by customers' demands. In addition, MO helps organizations to reconfigure their other resources to offer customers added value by investing in competitive, differentiated and also suitable marketing programs (Shin & Aiken, 2012).

Therefore, under conditions of competitive environment, knowledge about customers and market are often noted as significant enablers to the development of SMEs; it is also an important aspect where SMEs offer new products or processes (Celuch & Murphy, 2010). Inasmuch as MO represents one of the most sensitive resources (Anca & Cruceru, 2012; Lertwongsatien & Ravichandran, 2005), Kohli and Jaworski (1990) arguments confirm that the focus of MO is one of firm's ability to meet changes in customers' wants and market conditions. Nevertheless, there is little known about the role of MO on enhancing technological innovation. As such, previous studies have called for more empirical evidence in this area (L.ütfihak Alpkan, Şanal, & Ayden, 2012; Chao & Spillan, 2010; Kim, Im, & Slater, 2013; Polo Peña, Jamilena, & Molina, 2012; Renko et al., 2009; Jing Zhang & Duan, 2010).

1.2 Research Problem

Urban life in the Kurdistan region of Iraq dates back to 6000 BC where the oldest inhabited towns existed. The capital, Erbil, located at the heart of this region has been selected by the Arab Council of Tourism as the tourism capital in 2014. For long periods; this region was famous for its various industries, especially the traditional ones. Also, the Kurdistan region has regional and international stature, due to its strategic location among warring countries and its strong relationship with the great powers. Nevertheless, some political and economic conditions that hit the region in the period between 1991 and 2003, have led to deterioration of the domestic industries. Decreasing domestic and foreign investments in manufacturing industries has weakened the ability of local products to compete with foreign rivals. In addition, there were trends of dumping domestic markets with inexpensive and inferior products, given the weak legislation that did not adequately support the industrial environment (RDSKR, 2011).

Given these deteriorating conditions of the industrial public sector (RAND, 2014; Tas, 2012), the Kurdistan region of Iraq witnessed a wide range of privatization for large governmental enterprises to overcome the problem of low level of performance and innovation of new products. However, such enterprises represent only a small percentage in the structure of the industry, operating in specific industrial areas, while SMEs comprise 2,607 industrial enterprises distributed in the three provinces of the Kurdistan region (MTIKRG, 2013).

According to the center for international private enterprises (CIPE), and in comparison to neighboring countries, the private industrial sector in the Kurdistan region of Iraq, particularly SMEs, is seriously underdeveloped in terms of professional human resources, legislation, technology, appropriate knowledge to the current industrial evolution and production (CIPE, 2007).

The Regional Development Strategy for Kurdistan Region (RDSKR) report in 2014 indicates that SMEs in Kurdistan region seem to be one of the fundamental solutions for building a sustainable industrial base to overcome economic problems related to the increasing unemployment rate and to reduce reliance on imported goods (RDSKR, 2014).

Small and Medium Sized Enterprises (SMEs) have become a pillar of economic growth all over the world. Hence, SMEs economic contributions play an essential role in reducing the unemployment rate by creating new jobs in different fields and serving as suppliers for larger companies (Ar & Baki, 2011; Costică, 2013). Industrial SMEs in the Kurdistan region constitute about 95.5% of all working businesses, contribute about 4.08% to the Gross Domestic Product (GDP) of the region and provide more than 13,331 job opportunities. These low contributions may be a reflection of their weak ability to innovate new products and manufacturing processes (RDSKR, 2011).

According to the CIPE and RDSKR, industrial SMEs are still characterized by weak innovation capability, especially technological capability, that can provide new products and manufacturing processes to cover local market needs and to compete with imported goods as in the past (CIPE, 2007; RDSKR, 2014).

Broadly, this weakness can be attributed to numerous factors, such as low capacity of the banking system and insurance sector to support the industrial sector and provide funding and loans. Based on the Research and Development Corporation's (RAND) report (2014), the biggest subsidy has been dedicated, at the expense of industrial SMEs, to only big enterprises and other non-industrial sectors in the region. This has resulted in industrial SMEs not being able to venture into risky products or manufacturing processes, in addition to the poor response to the requirements of customers. Besides, the obsolescence of production lines and their non-compliance with modern environmental and industrial conditions have reduced the innovativeness of SMEs compared to contemporary requirements (RDSKR, 2014).

In relation to that, and in the light of existing circumstances, new enterprises' efforts can sometimes be directed to non-innovative activities, such as too much time being wasted lobbying the governmental agencies for private favors (RAND, 2014). For example, profiting from the advantages granted to entrepreneurs, such as obtaining land and new trucks.

Procedures have the same effects as the aforementioned reasons and involve preservation of property rights, execution of contracts, rule of law, an acceptable level of taxes on industrial activities and a stabilized macroeconomic environment. In fact, not all of these procedures are under the control of the KRG. Specifically, the KRG has ineffective control on the working macroeconomic climate, since it does not control the funding process and has only simple taxing power. In addition, it has no strong effects on other aspects, such as preservation of property rights, execution of contracts and the rule of law (CIPE, 2007; IFC, 2011; RDSKR, 2014). Hence, it can be argued that these factors are behind the weak entrepreneurial trends and receding of the climate that can assist innovation.

Another reason for poor innovation capabilities of SMEs is the weak interest in developing curriculum at the pre-university, vocational and higher education levels, in addition to the limited training opportunities for developing workers' skills in the industrial sector (RAND, 2012; RDSKR, 2011, 2014). These inadequacies have reduced the ability of workers to absorb new knowledge. It has also limited entrepreneurs' abilities to set up good entrepreneurial projects.

In essence, the government's support to develop workers' skills to provide them with new relevant knowledge in their work area is devoted to support government workers exclusively. For example, training courses abroad in collaboration with the Ministry of Humanitarian Aid and Cooperation (MHAC) and Ministry of Planning (MOP) are dedicated to government employees, and

such opportunities are not available for private sector workers, even at the local level (MOP, 2009).

Further, working conditions in the private sector are characterized by the absence of social and health security and low level of wages. The expansion of employment in the public service sector has made the private sector, especially the industrial sector, an environment lacking in skills (RDSKR, 2014). These factors reflect negatively on the ability of workers to possess sufficient knowledge to raise the innovation level in their industries as well as their weak ability to acquire new knowledge from outside their enterprises that can enable them to introduce new products and utilize innovative manufacturing processes (RDSKR, 2014).

The lack of standardization and control over the quality of imported and domestic products and the weaknesses of marketing processes, have led importers to importing low-quality goods and missing out the opportunity to identify the actual requirements of their customers (IFC, 2011; RDSKR, 2014). In this regard, the CIPE (2007) report indicates that the SMEs suffer from traditional and monotone measures of customer needs. This is another reason that may justify the inability of local products to vie with imported products. These factors reflect negatively on using customers' preferences and marketing processes as mechanisms to innovate.

In light of the above discussion, this research believes that one of the issues leading to the present decline in innovation capabilities in industrial SMEs is lack of proactive and risk-taking attitude and innovativeness within these enterprises, which are associated with entrepreneurial orientation (EO), compounded with the weak capacity of these enterprises to absorb and actively exploit the externally generated knowledge which are associated with absorptive capacity (ACAP) concept. These have contributed to the poor estimation of customer and market demands, and weak capability to generate intelligence about them, which are related distinctly to the concept of MO.

In considering a proper means to deal with the aforementioned identified problems, the Resources-Based View (RBV) is selected as the underpinning theory for the present research. The reasons behind selecting this theory is based on its soundness, reliability and its validity in many studies (Foss & Ishikawa, 2007; Todorovic & Ma, 2008; Wiklund & Shepherd, 2003).

Using the RBV, several researchers have examined the effect of EO on SMEs' innovation. Some of these researches have tried to evaluate the direct and indirect effects of EO on technological innovation within industrial SMEs. Boso et al. (2012a, 2012b) utilized the RBV in order to explain the relationship between EO, MO and product innovation. These studies clarify that the adoption of EO and MO behaviors is invaluable for firms working in competitive markets. Hong, Song, and Yoo (2013) conducted a study in Korea by utilizing the RBV to predict the indirect effects of strategic orientation

represented in EO and MO on new product success; they found that the RBV is applicable and efficacious in predicting the role of these two resources in new product performance.

Related studies have pointed out three incorporated dimensions of EO, namely: risk taking, pro-activeness and innovativeness (Baker & Sinkula, 2009; Jones & Rowley, 2011; Miller, 1983; Wales et al., 2013). The majority of these studies have been conducted in large-sized firms within mature and stable economies and developed countries. Therefore it is important to extend the study on the effect of EO on technological innovation capabilities within SMEs in a developing economy, like the Kurdistan region of Iraq.

Mixed findings have been acknowledged regarding the direct and indirect influence of EO on innovation. Some studies have associated EO with firm performance (Messersmith & Wales, 2011; Morris et al., 2007; Ramayah, Hafeez, & Mohamad, 2016; Wales et al., 2013; Zellweger, Nason, & Nordqvist, 2011). Some others have linked EO to firm profitability and growth (Baker & Sinkula, 2009; Messersmith & Wales, 2011). There are also many conceptual models that need empirically justify the existence of a relationship between EO and innovation within the SME environment (Jones & Rowley, 2011). Some others have found that EO has no effect on innovation (Hong et al., 2013; Messersmith & Wales, 2011; Renko et al., 2009).

Other studies have employed the RBV to predict the role of ACAP in innovation in the context of SMEs. For example, Mason-Jones, and Towill (2016) reported that ACAP is a prerequisite capability for obtaining innovation from external sources. While Liao, Wu, Hu, and Tsui (2010) discussed the mediating role of ACAP on the relationship between knowledge acquisition and innovation capability within knowledge-intensive industries in Taiwan. Their study proved the full mediating role of ACAP. Park and Rhee (2012) studied the moderating effect of ACAP on the relationship between knowledge competency and its antecedents and they concluded that ACAP can strengthen firms' knowledge competencies based on resources that result in excellent performance.

Further, few empirical studies (Foerstl & Kirchoff, 2016; Hurmelinna-Laukkanen, 2012; Nagati & Rebolledo, 2012; Type & Marketing, 2016) have focused on examining ACAP in the context of customer-supplier relationships within the industrial sector. In addition, in their efforts to measure firms' innovation, a sizable number of researchers have already focused their attention, either to investigate the relationship between ACAP and firm performance (Flatten, Greve, et al., 2011; Hurmelinna-Laukkanen, 2012; Kim, Zhan, & Erramilli, 2011; Nagati & Rebolledo, 2012); or the relationship between ACAP and competitive advantage (Deng, 2010; Delmas, Hoffmann, & Kuss, 2011).

Despite the abundance of research and literature, there is still a gap in the study of ACAP and its impact on technological innovation capabilities. Some of these researches have previously investigated the effect of ACAP on firms' innovation (Knoppen, Saenz, & Johnston, 2011; Tseng, Pai, & Hung, 2011; Wang & Han, 2011) without looking at other factors, such as firms' innovativeness and risk-taking; or the level of knowledge about customers or competitors. Others have examined some of these factors but only briefly and have ignored some pivotal dimensions of these factors (Chang et al., 2012; Delmas et al., 2011; Muller-Seitz & Guttel, 2013). Some researches have highlighted some aspects of ACAP through an investigation of some of its dimensions (Bouncken & Kraus, 2013; Gallego, Rubalcaba, & Hipp, 2012; Liao et al., 2010).

Given the tremendous advances, it is necessary for SMEs to have the knowledge and deep understanding of their customers and competitors through the possession of a high level of market orientation (MO), because MO is typically engaged in producing something unprecedented to meet market conditions. Thus, it is considered as a critical antecedent of innovation (Li, Wei, & Liu, 2010; Newman, Prajogo, & Atherton, 2016; Cheng Lu Wang & Chung, 2013).

Moreover, MO is also considered as a continuous extension of entrepreneurial orientation (EO) behavior (Blesa & Ripolles, 2003), as the behavior of EO appears to influence and be significantly associated with MO in SMEs (Baker

& Sinkula, 2009). Blesa and Ripolles (2003) confirmed that firms with a low level of EO are less likely to consider MO and innovation. Li et al., (2008) presented several evidences for the synergistic effect between EO and MO on innovation in Chinese small firms. Same result highlighted by (Ramayah et al., 2016).

Additionally, Raju et al., (2011) conceived firm's capacity to combine and interpret knowledge from outside as a requisite antecedent of MO. Chang et al., (2012) found that market responsiveness is mostly affected by the level to which a firm has better capability to identify and assimilate externally generated knowledge rather than by a firm's capability in reconfiguring its prior knowledge to adapt to the market conditions.

Hence, this research intends to provide evidence and empirical understanding of antecedent factors that affect technological innovation capabilities within the context of industrial SMEs. This research tries to bridge the knowledge gap in the role of specific resources and capabilities, namely: EO and ACAP, in promoting TIC. Moreover, the research examines the relationship between MO and TIC, and whether MO plays a mediating role between EO, ACAP and TIC.

1.3 Research Questions

This research explores the direct role of EO and ACAP in the improvement of TIC and through the relationships developed with MO. Thus, this research attempts to answer the following questions:

1-What are the relationships between entrepreneurial orientation (EO), absorptive capacity (ACAP) and technological innovation capabilities (TIC)?

2-What are the relationships between entrepreneurial orientation (EO), absorptive capacity (ACP) and market orientation (MO)?

3-What is the relationship between market orientation (MO) and technological innovation capabilities (TIC)?

4-Does market orientation (MO) mediate the relationships between entrepreneurial orientation (EO), absorptive capacity (ACAP) and technological innovation capabilities (TIC)?

1.4 Research Objectives

This research is conducted to evaluate the influence of EO and ACAP on TIC and examine the mediating role of MO on these relationships within the industrial SMEs in the Kurdistan region of Iraq. To simplify this, the researcher has designed the following objectives to grasp the research problem and provide answers to the research questions:

1-To examine the relationships between entrepreneurial orientation (EO), absorptive capacity (ACAP) and technological innovation capabilities (TIC).

2-To examine the relationships between entrepreneurial orientation (EO), absorptive capacity (ACAP) and market orientation (MO).

3-To examine the relationship between market orientation (MO) and technological innovation capabilities (TIC).

4-To examine whether market orientation (MO) mediates the relationships between entrepreneurial orientation (EO), absorptive capacity (ACAP) and technological innovation capabilities (TIC).

1.5 Research Scope

In Iraq the broadly troubled country, Kurdistan region shines as a projects beacon and become an attraction point for many investments. In comparison to the rest of Iraq, Kurdistan region has seen relatively less violence and enjoyed stabilize circumstances in different aspects. Since 2007, investments in the Kurdistan region have reached US$26 billion especially after the approval of the facilities granted by the government to outside investors, particularly in the oil, construction and real estate sectors have been grown, in addition, booming other business activity turn the Kurdistan region to be the gateway to doing business in the rest of Iraq (Atkinson, 2014). These reasons motivate the researcher to select the Kurdistan region to be the context of the research.

This study adopts the definition employed by the Ministry of Industrial and Trading of Kurdistan region government (MTIKRG). A SME is an enterprise under the MTIKRG that depends mainly on specific craft with full-time employees not exceeding 100.

Industrial SMEs in the Kurdistan region are selected in this study. These enterprises are chosen because SMEs are generally characterized by widespread, low capital costs needed to start the enterprise; SMEs depend on

informal loans in many cases, and also are labor-intensive that contributes to providing many job opportunities. Further, SMEs' technological requirements are not extremely complex. Thus, they can be based on a low level of specialization and division of labor.

On the other hand, the importance of SMEs is reflected in their role to fight poverty and unemployment and confront the negative social effects of economic reform programs, in addition to their ability to contribute effectively to the economic development through their impact on some macro-economic variables, such as GDP, consumption, investment, employment and exports. Moreover, these enterprises have become the driving force behind a large number of inventions and they bridge the huge gap in the production chain by providing larger companies with the necessary supplementary materials and products.

The list of industrial SMEs in the Kurdistan region was obtained from the MTIKRG based on the SMEs' Directory of June, 2013. These enterprises are distributed among the three provinces of the region: Erbil, Sulaimany, and Duhok, comprising eight industries, namely: machinery and equipment; construction materials; food; electric; non-metals; metals; textiles; and paper industries.

The present study's dimensions were selected on the basis of resource-based theory that participates in new technological innovation (Taghian, 2010) and on the basis of an extensive reviewing of related literature of entrepreneurial orientation and absorptive capacity as a valuable resources which help firms in protect them from imitation and support their innovation activities (Barney et al., 2013). Within the same context, reviewing related literature of resource-based theory by Hunt and Morgan (1995) and Barney (1991), revealed that market orientation considered as an important and valuable resource to the firms, due to the focal role of market orientation in developing the suitable knowledge about customers and competitors in addition to support innovation capabilities (Kohli & Jaworski, 1990; Narver & Slater, 1990) to achieve effective and efficient ways in adding value to the produced products.

As regard to scope of research methodology, hypotheses testing design has been adopted, where data collected by self- administrative questionnaire, then the collected data analyzed using PLS-SEM 3.2.0 software.

1.6 Significance of the Study

This study is expected to contribute towards TIC among industrial SMEs by decreasing the potential stumbling blocks of technological innovation adoption, highlighting the role of EO and externally generated knowledge and ACAP in addition to the role of MO in stimulating innovation.

The absence of a theoretical framework that reflects the influences of entrepreneurial and market orientations in addition to the combined effect of ACAP and MO have resulted in a gap in the existing literature. Filling such a gap can help industrial SMEs in their attempts to gain TIC, and then employ that to achieve competitive advantage.

Therefore, this study hopes to contribute by producing a TIC model based on confirmed behavioral factors. This will help the industrial SMEs to work by focusing on knowledge of both internal and external sources. In addition, it is hoped the findings can contribute to enhancing the significant role of MO in mediating the relationship between EO, ACAP and TIC.

It is hoped the proposed model can provide two mechanisms that can be used by SMEs to enhance their TIC. The first one is a balancing mechanism provided by the influences of both EO and MO. Broad emphasis on entrepreneurial efforts can confuse firms' existing capabilities, if these activities are exposed to failure, whereas, overemphasis on MO operations may make it difficult for the firm to avoid the demanded customers. Therefore, considering both orientations can balance a firm's innovative efforts. The second mechanism is the responding and filtering mechanism, which is provided by integrating effects of both ACAP and MO; this is because the mere existence of external knowledge about customers and markets does not necessarily mean such knowledge can be utilized easily. Such mechanism leads firms to shift from single-loop of learning (the relationship between MO

and TIC) to double-loop of learning (the relationship between ACAP and TIC through MO) to meet customers' current and potential needs.

The present study investigates the role of some behavioral factors that may affect TIC in a developing country, like Iraq, given the insufficient studies conducted in this country, in general, and the Kurdistan region, in particular, that deal with the topic of innovation capabilities.

From the practical perspective, the present industrial SMEs in the Kurdistan region are aware of innovation importance but are not sure about the proper way to be innovators. Therefore, this study may help to improve the current state of understanding of industrial SMEs seeking to comprehend the issue of TIC in the Kurdistan region, a rather challenging issue facing such enterprises today.

Assessment of customers' current and future needs undertaken in this study will benefit SMEs' management to understand customers' behavior. This, will in turn, increase the potential success and growth of industrial innovation in both product and manufacturing processes, due to the necessity to keep improving marketers' understanding of customers' behavior, both from a personal perspective and also in terms of market demands.

Further, this research would help SMEs to analyze their industrial markets, target the right segments of customers and evaluate their performance, hence,

implementing more efficient and pertinent plans and procedures based on their understanding of customers' attitudes towards their new products.

This study also hopes to help policy-makers, governmental agencies and industrial SMEs to gain better understanding related to SMEs' problems in their endeavor to compete and survive in a competitive environment.

Finally, since the government has tried to stabilize the security and allocated a substantial amount of funds to develop this region, it is important to yield its contribution to the economy as a whole over continuance of the industrial business. The outcome of this study is expected to be used by the Kurdistan government and agencies to develop the best strategies to enhance industrial SMEs in this region, in conjunction with initiatives aimed at increasing cooperation with foreign companies to increase their experiences and support their competencies to exploit externally generated knowledge.

1.7 Definition of terms

This section provides a brief definition of important terms that appear repeatedly in the context of this study:

1-Technological Innovation Capabilities (TIC) - the capability of the firm to implement: new products or enhance the existing ones, services or process, new marketing approaches, new business practices and external connections (Basterretxea & Martinez, 2012; Camisón & Villar-López, 2012b; Damanpour, 1991; OECD, 2005; Tuominen & Hyvönen, 2004).

2-Entrepreneurial Orientation (EO) - the firm's ability to initiate change so as to be considered as innovative and risk-taker, and operate proactively in its pursuit to promote the innovation (Millert, 1983; Otero-Neira et al., 2013; Wang & Altinay, 2012).

3-Absorptive Capacity (ACAP) – firms' capabilities and qualifications, by which they acquire, assimilate, transform and exploit external knowledge from partners, suppliers and customers to promote innovation (Flatten, Greve, et al., 2011; Liao et al., 2010; Zahra & George, 2002).

4-Market Orientation (MO) - the firm's ability to generate intelligence that relates to present and future needs of customers, dissemination of this intelligence among departments or main activities of the firm and taking the necessary actions to respond to such market intelligence (Chung, 2012; Kohli & Jaworski, 1990, 1993; Todorovic & Ma, 2008) .

1.8 Organization of the Thesis

The present study starts with chapter one as an introduction which covers the background information about industrial SMEs and technological innovation capabilities in the Kurdistan region of Iraq. It is followed by the research problem, objectives of the research, research questions, significance, operational definition of terms and the scope of the study.

Chapter two sheds light on the following topics: review of technological innovation capabilities (TIC); review of entrepreneurial orientation (EO) and absorptive capacity (ACAP), in addition to their relationship with technological innovation; review of market orientation (MO) and its mediating role on the relationship between EO, ACAP and TIC; and review of the RBV. Finally, the adopted research framework by this study and hypotheses development are provided.

Chapter three deals with the research methodology, by focusing on the research method, sampling design, design of the questionnaire, measurements and instrument. Further, it focuses on procedures for data collection and the statistical techniques used in this research.

Chapter four shows the outcomes of hypotheses testing, in addition to the validity of the proposed model and the standard data analysis technique used, i.e., structural equation modeling (SEM). Finally, chapter five provides the conclusion, recommendations and major limitations of this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses the theoretical concepts of the variables under consideration. The first section sheds light on technological innovation capabilities (TIC) within two dimensions: product and process innovation capabilities. It then provides a theoretical background about the antecedents of technological innovation and its nature in SMEs. The second section discusses the conceptualization of entrepreneurial orientation (EO) and its essential components, namely: innovativeness, proactive-ness and risk-taking. This chapter also provides a discussion about absorptive capacity (ACAP) and its sub-dimensions represented by knowledge acquisition, knowledge assimilation, knowledge transformation and knowledge exploitation. Theoretical discussion of market orientation (MO) is also provided in this chapter in terms of its main components, namely: intelligence generation, intelligence dissemination and responsiveness, in addition to its importance and mediating role. Finally, the adopted underpinning theory, theoretical framework and the hypotheses which are developed are discussed.

2.2 Technological Innovation Capabilities

The business innovation phenomenon was first initiated in the early human settlements and it has since affected civilizations and cultures. The newly invented innovative production and supply methods have always had great

significance to the social group's survival in a competitive environment. Some innovations have resulted in both agricultural and industrial revolutions with their great and ongoing impacts on human life (Inauen & Schenker-Wicki, 2011; Ooi, Lin, Teh, & Chong, 2012).

Nowadays, firms are facing increasing customers' requirements and needs more than ever before. In the midst of such circumstances, successful firms are those which are capable of satisfying customers' needs optimally and not those whose determination is confined to the market's needs. To achieve such a feat, innovation is considered as a suitable means (Menguc & Auh, 2010; Otero-Neira, Lindman, & Fernández, 2009). Hence, the general consensus is that 'innovation is power' for the present firms (Kamasak & Bulutlar, 2010).

The term 'innovation' is taken from the Latin word, 'novus' or 'new', and is defined as a new idea, method or device or the process of presenting something new (Damanpour, 1991; Sarros, Cooper, & Santora, 2008). Owing to the various points of view of researchers, innovation has been defined from different perspectives. Innovation can mean providing a new product/service that customers want. It refers to invention and commercialization (Ko & Lu, 2010; Narvekar & Jain, 2006). It includes employees' initiatives regarding the introduction of novel processes, new markets, new products or a combination of all in the organization (Huang & Wang, 2011; Perdomo-Ortiz, González-Benito, & Galende, 2009).

According to Kamasak and Bulutlar (2010), innovation is best understood as generation, adoption and implementation of new ideas, policies, programs, processes and products/services to the organization adopting it. Meanwhile, Crossan and Apaydin (2010) developed a comprehensive definition of innovation; they defined it as the generation or adoption, assimilation and use of a value-added new invention in the economic and social field that realizes the renewal and enlargement of products and development of novel production techniques; and the establishment of new systems of management. It is process as well as outcomes.

Nevertheless, majority of the definitions of innovation have the common premise that describe it as the adoption of a novel idea or behavior. Hence, it can be stated that innovation is extensively considered as the source of corporate survival and growth. It plays a key role in the creation of value and maintenance of competitive advantage (Baregheh, Rowley, & Sambrook, 2009). The definitions of innovation are listed in Table 2.1.

Table 2.1
Innovation definitions

Author (s)	Terminology	Adopted Definition
Xia, Yu, Xia, & Li, 2011	Technological innovation	The new combination of productive factor by entrepreneurs.
OECD, 2005	Technological innovation	Implementation of new technologies to achieve significant technological improvements in products and processes
Subramanian, 2012	Exploratory Innovation	A problem-solving process in which solutions to valuable problems are identified via knowledge exploration.
Mothe & Thi, 2010	Product innovation	The introduction of goods or services that are new or significantly improved with respect to their specifications or intended uses.
Gallego et al., 2012	Organizational innovation	The changes in the hierarchies, routines and leadership of an organization that result from implementing new structural, managerial and working concepts and practices in order to improve coordination of work-streams and employee motivation.
Sarros et al., 2008	Organizational innovation	Introduction of any new product, process, or system into an organization.
Martín-de Castro et al., 2013	Technological innovation	Complex activity in which new knowledge is applied for commercial ends.

Innovation includes magnitude and speed (Goktan & Miles, 2011); this description offers an efficient way of examining the relationship between innovation and firm performance (Carbonell & Escudero, 2010; Liao & Chechen, 2006). Innovation magnitude reveals the number of innovations that an organization adopts from an innovation source (Crossan & Apaydin, 2010). This magnitude represents the length and breadth of innovation in the firm; while innovation speed depicts the firm's capability of capitalizing on technology progression (Cheng, Chang, & Li, 2012). It shows the organization's swiftness in adopting a product/process compared to its rivals in the same industry (Liao & Chechen, 2006).

Various innovation types are highlighted in literature. The Organization for Economic Co-operation and Development's (OECD) definition differentiates between four types of innovation, namely: product innovation, process innovation, marketing innovation and organizational innovation (OECD, 2005). Product and process innovations are categorized under technological innovation and is defined as the invention of novel technologies and the development and presentation of products, processes or services into the marketplace, based on these new technologies (Camisón & Villar-López, 2012b; Ko & Lu, 2010; Narvekar & Jain, 2006).

The most widely accepted classification is the one brought forth by Damanpour (1991), wherein he differentiates between technological and administrative innovation. Technological innovation refers to new processes, products and services; while administrative innovation refers to novel procedures and policies, covered under the umbrella of non-technological innovation (Jiménez-Jiménez & Valle, 2011; Ngo & O'Cass, 2013).

With regards to technological innovation capabilities (TIC), the increasing pressure from global competitiveness, decreased product life cycle and ease of imitation, make it necessary for the firms to continue their innovation in order to remain competitive. In other words, innovation has become the platform for productivity enhancement, growth of sales volume and firm competitiveness. Such pressures are also urging firms to create and innovate to improve their product competitiveness in terms of design, quality and service reliability. As

such, firms have to upgrade their innovation capability to develop and commercialize new technologies effectively and bring about the development of technological innovations throughout the organization to reinforce their competitive advantage (Börjesson, Elmquist, & Hooge, 2014; Wang, Lu, & Chen, 2008).

Drucker (1954), as the pioneering scholar who discussed the importance of innovation capability within the organizations, cited in Yeşil, Koska, & Büyükbeşe (2013), argued that the firms must innovate for their survival in an ever-changing environment. Thus, innovaiton capabilities are considered as fudamental components to fulfill optimum innovation outcomes. In a related study, Wang et al., (2008) described innovation capability as the employment of several scopes and levels to achieve a firm's strategic requirements, to accomodate unique firm circumstances and the fluctuating environment. Meanwhile, Lall (1992) emphasized the fundamental role of technological capablity as the way in which firms absorb, create, modify and produce feasible tehcnical applications in the form of new technologies, new processes, new products and new routines, in the realm of knowledge (Zawislak, Alves, Tello-gamarra, Barbieux, & Reichert, 2012).

A systems perspective was adopted by O'Connor (2008) to discuss innovation capabilities, in which he described them as comprising seven interdependent elements, namely: "*organizational structure, interface mechanisms with the mainstream firms, exploratory processes, skills and talent development, multi-*

phase governance and decision making mechanisms, suitable culture and lastly, leadership". Owing to their interdependence, their development calls for changes in the system and their inclusion as elements in the strategic plan of the firm. This stresses the significance of a detailed testing of capability elements to reinforce different dimensions of this concept, both conceptually and practically (Börjesson et al., 2014). Adler & Shenhar (1990) identified innovation capabilities through the following dimensions: *"(1) ability to develop new products that meet market needs; (2) ability to apply appropriate process technologies to producing these new products; (3) ability to develop and adopt these new products and process technologies to satisfy future needs; and (4) ability to respond to related technology activities and unexpected activities created by competitors*".

In a similar vein, Börjesson et al., (2014) referred to innovation capabilities along the following dimensions: resources that cover human resources, equipment, technologies, product designs, information, cash and relationships with external stakeholders; processes that cover all required methods and activities to change inputs into valuable outputs and cover the patterns of the firm's cooperation, coordination and decision-making; and lastly, values that encompass criteria of decision-making and the decision makers' mindset. From the above, it is evident that the innovation capabilities concept is often defined in general contexts.

As it is obvious, all these dimensions revolve around technological innovation capabilities (TIC) of an enterprise. Thus, TIC is considered as one of the most critical factors to the enterprise in achieving competitiveness from the RBV perspective, due to the fact that such capabilities might award extra valuable, scarce, differentiated and inimitable products and process simultaneously to a higher level of competition (Dhewanto et al., 2012).

Accordingly, continuous innovation hinges on a firm's dynamic capabilities as these assist in its integration, building and reconfiguration of its internal and external competencies to tackle the ever-changing market environment. This is only possible through the activation, copying, transference, synthesis, reconfiguration and redeployment of various skills and resources (Branzei & Vertinsky, 2006; Teece, Pisano, & Shuen, 1997; Tuominen & Hyvönen, 2004).

A firm's ability to launch new products and adopt new processes in a shorter time has become very important (Guan, Yam, Mok, & Ma, 2006); this requires the ability to efficiently launch new products and to employ new processes (Camisón & Villar-López, 2012b; Lawson & Samson, 2001; Tepic, Fortuin, Kemp, & Omta, 2014). Further, innovation capabilities are described as the power of the firm to implement new or enhanced goods, services or processes, or even new marketing approaches, or new business practices and external connections (Basterretxea & Martinez, 2012; OECD, 2005; Tuominen & Hyvönen, 2004).

This study follows Damanpour's (1991) definition to discuss and explain the dimensions of technological innovation capabilities (TIC) and define it as a special kind of resources that needed to effectively enhance existing product, manufacturing process and to create new ones, which are the foci of this study, as explained in the following sections.

2.2.1 Product Innovation Capabilities

Product innovation (PRDI) is categorized into different types according to the dimensions of technology, market, novelty or domesticity to the specific product line of the firm (Classen, Gils, Bammens, & Carree, 2012; Sandmeier, Morrison, & Gassmann, 2010; Junfeng. Zhang, Benedetto, & Hoenig, 2009). The dimension of technology depends on whether the employed technology to the PRDI was formerly present in the firm (Carmen & José, 2008; Cheng et al., 2012; Danneels, 2002). Low rate of required technology may indicate that the firm is already in possession of competency with this technology type; whereas a high rate of required technology indicates the absence of competency of this technology type.

Meanwhile, the dimension that relates to the market shows the level to which PRDI is new to the specific market (Danneels, 2002; Pullen et al., 2012). Lastly, the dimension of novelty shows whether or not the PRDI makes use of existing product lines (Cheng et al., 2012; Iii, Damanpour, & Santoro, 2009). If in its attempt to innovate, the firm exploits the present product lines, the level of recency to the firm is minimal. On the contrary, if the firm exploits new

ideas, the newness or recency level to the firm's product is considerable. The recency of a PRDI is determined by the dimensions of technology, market dimension and the level of recency to the firm's present product line.

In addition, innovation novelty can impact PRDI outcome (Chen & Tsou, 2012; Cheng et al., 2012; Iii et al., 2009). An innovation that is foreign to customers may call for further marketing endeavors to maximize customers' consent, but this may represents another obstacle in front of the firms. Consequently, assigning the newness level of a PRDI is substantial for determining the road to successful PRDI (Cheng et al., 2012; Verhees, Meulenberg, & Pennings, 2010). PRDI includes a complicated connection between market needs and technologies and is a potential source of competitive advantage for a firm (Gebauer, Worch, & Truffer, 2012; Zhang et al., 2009).

Owing to the significance of innovation for the survival of the firm, it is expected that several firms often attempt to enhance their innovative capabilities (Goktan & Miles, 2011; Sarros et al., 2008). Specifically, SMEs face numerous challenges in their innovation process because of shortage of financial and human resources (Guo & Shi, 2012; Kim, Lee, & Oh, 2009). With regards to efficiency, SMEs have to concentrate on their core competencies (Danneels, 2002). This concentration on competencies indicates that it is not possible for SMEs to do everything on their own, and hence, they require assistance in their development of new products (Liao, Welsch, & Stoica, 2003b; Raju et al., 2011) through inter-organizational relationships. In this way,

the innovation burden can be taken up by several different parties (Pullen et al., 2012; Ritter & Gemünden, 2004).

A firm's capabilities to launch an infallible PRDI include the abilities of the firm to obtain and spread externally generated knowledge for its transformation into distinct competencies and notions and then employing them by producing and commercializing products that are new and improved (Cohen & Levinthal, 1990; Zahra & George, 2002). Also, PRDI capability refers to the sets of interrelated route that are employed to engage a distinct product innovation-related manufacturing method in different areas, such as new product development and existing product improvement (Menguc & Auh, 2010; O'Cass & Sok, 2013).

At the onset, market competition was focused on PRDI but as the industry and market continued to mature, the firms expanded and the differentiation between the competing products decreased after which competition was based on price. As a result, efforts towards innovation shifted from the product to the reduction of costs in process manufacturing technologies (Smith & Chang, 2010; Zhou, Minshall, & Hampden-Turner, 2010).

2.2.2 Process Innovation Capabilities

Technological innovation has become more process-oriented, where it is based on minor modification to the manner in which products achieve their functional objectives or are produced (Eisenman, 2013). Process innovation (PRSI)

encompasses introduction of novel elements in the tasks, decisions and systems of the organization or novel production approaches or service operations and technological advances of the firm (Crossan & Apaydin, 2010; Goktan & Miles, 2011).

Several researchers have explored the concept of PRSI and defined it as organization-wide efforts involving basic rethinking and essential redesign of manufacturing and related processes/systems to fulfill significant improvements in manufacturing performance indicators, including cost, quality, service and speed (Yamamoto & Bellgran, 2013).

PRSI is also defined as the employment of new or improved production or delivery techniques. It may relate to changes in equipment, human resources, working methods or a combined version of all (Bear & Frese, 2003; OECD, 2005); and implies considerable stress on the work methods within the firm (Ar & Baki, 2011; Goktan & Miles, 2011).

PRSI contributes several benefits to an organization and assists it in achieving competitive advantage (Bear & Frese, 2003; OECD, 2005). There appears to be little doubt nowadays of the fact that PRSI, particularly in the manufacturing field, can have a significant effect on productivity (Ettlie & Reza, 1992).

Manufacturing technologies used to develop innovation capabilities, enable firms to select and utilize these technologies strategically (Zawislak et al., 2012), to develop novel techniques, processes and production methods and to launch new products. This is based on the premise that technology development capability stems from the learning process upon which firms can internalize new knowledge to bring about technological change and eventually new products and processes (Lall, 1992). Such a learning process comprises acquisition, imitation, adaptation, modification and/or the creation of new knowledge bundles to be used within the firm. Consequently, this process leads to potential products and having new technical patterns as these are in fact, technological innovations (Zawislak et al., 2012).

In this regard, Zawislak et al.,(2012) contended that capabilities are driven by the knowledge of the manufacturing process. They stressed that this knowledge is produced via a path-dependent process and learning-through-doing, and formed by a set of firm contingencies.

Enhancement of resource productivity via basic technological process innovation is indispensable owing to the several ecological obstacles in the industries, such as pollution and limited resources. Therefore, manufacturing firms have to bring about technological process innovations in order to divert towards more sustainable and efficient production methods that enable a greater level of minimization and reutilization of crude resources, energy and leftover streams in their system of production. In addition, technological process

innovation refers to the fact that a firm has generated a new idea and has begun to employ the outcome in its manufacturing activities. While technological product innovation has garnered significant attention from authors, technological process innovation remains largely ignored, and as such, it calls for in-depth and extensive studies (Hollen, Van Den Bosch, & Volberda, 2013).

To this end, O'Connor (2008) contended that process-oriented management leads to the stability of routines and it maximizes efficiency in a short span of time. This initiates internal biases for certainty and predictable outcomes. Process management focus leans towards exploitative innovation as opposed to exploratory innovation.

SMEs are sometimes challenged by the lack of financial resources and qualified personnel who are capable of developing production processes, which result in creating a necessity for collaborations among them (Pullen et al., 2012). Therefore, PRSI is influenced by the level to which the enterprise is capable of activating the acquired knowledge from outside (Han & Erming, 2012). For instance, strategic alliances between potential rivals is an invaluable method to enhance production systems and methods (Gebauer et al., 2012; Jung-Erceg, Pandza, Armbruster, & Dreher, 2007). Therefore, PRSI may seem to be formed from a series of learning cycles as opposed to structured steps (Yamamoto & Bellgran, 2013).

Another factor affecting PRSI is the complexity level of the product, because the modularity of the product design is a critical success factor as it enables the decoupling of processes in order to develop new products and enable the processes to be more concurrent along with autonomy and distribution, which in turn, enable modular firm designs to be employed for the purpose of product enhancement (Danneels, 2002; Ritter & Gemünden, 2004).

In this context, product innovation is able to support the development of organizational competencies, while PRSI improves managerial expertise and contributes to easier work and accurate assistance in bringing about change in the environment and achieving top position in the market.

2.3 Innovation-Related Terms

Despite the presence of synonymous terms for innovation, several researchers are convinced that innovation should be considered distinct from them as their meanings and indicators are different. Some of these terms are explained as follows:

2.3.1. Creativity

Creativity is defined as the ability to invent something novel, while innovation is the implementation of a new idea by converting the new idea into reality in the form of new product, process or service (Ar & Baki, 2011; Keh, Nguyen, & Ng, 2007; Kim, Im, & Slater, 2013). However, creativity may be considered as

the first phase of innovation process and it is described as the development of new and useful ideas, for the short and long-terms (Baer, 2012).

2.3.2 Invention

Invention is to find something unknown before and not a result of the combination of two or more inventions and has the ability to be commercialized (Alvarez, 2001; Baregheh et al., 2009; Narvekar & Jain, 2006). In addition, it represents the initial developed idea, while innovation is invention and commercialization (Pullen et al., 2012).

2.3.3 Change

Change is the implementation of an organizational method that has not been applied before in the firm and it originates from strategic decisions (Camisón & Villar-López, 2012b). It represents an adopted behavior or idea that is different from those already in existence (Ven & Huber, 1990). It is extensive, continuous and consistent with innovation but innovation is more risky and costly (Iii et al., 2009). In other words, change and innovation are complementary elements as innovation is a crucial process in which the change happens (Goktan & Miles, 2011; Narvekar & Jain, 2006).

2.4 Antecedents of Technological Innovation

Different types of innovation frameworks have been created consistent with the firm's strategic objectives (Ko & Lu, 2010). On the basis of the RBV, firms obtain competitive advantage by using resources to develop new products and

processes (Beck, Janssens, Debruyne, & Lommelen, 2011; Pullen et al., 2012), which reflect the firm's proactive response to environmental changes (Lee & Tsai, 2005; Hughes, Hughes, & Morgan, 2007). Thus, the organization can obtain some type of advantage which it could transform into positive outcomes (Carmen & José, 2008).

However, researchers have stressed on some of innovation's key determinants, some of which concentrate on organizational support (Alpkan, Bulut, Gunday, Ulusoy, & Kilic, 2010; Camelo, Fernández-Alles, & Hernández, 2010). Others have tried to shed light on the role of knowledge and knowledge management in view of the steady relationship between them (Kostopoulos et al., 2011; Liao & Chechen, 2006; Wang & Han, 2011), while technological factors has drawn the attention of another group of researchers (Eisenman, 2013; García-Morales, Bolívar-Ramos, & Martín-Rojas, 2013; Parrilli & Elola, 2011). Studies also have addressed the role of resources outside the organizational boundaries, such as relational resources and the role of openness (Srivastava & Gnyawali, 2011; Zhao & Liang, 2011).

It is worth mentioning that most of the studies have focused on human capital (HC) dimensions as a behavioral factor that may affect innovation (Gallié & Legros, 2011; González-Loureiro & Pita-Castelo, 2013; Guo, Zhao, & Tang, 2013; Martín-de Castro et al., 2013; Subramanian, 2012; Suying, Rong, Zhang, & Zhang, 2011). Nevertheless, these studies have not given adequate attention to some of the behavioral factors within the concept of HC, such as EO

(Atuahene-gima & Ko, 2001; Todorovic & Ma, 2008), ACAP (Andersén, 2012; García-Morales et al., 2013; Knoppen et al., 2011), and MO (Adhikari & Gill, 2012; Atuahene-gima & Ko, 2001), despite their effective role in achieving technological innovation.

Pérez-Luño et al., (2011) revealed that innovative firms that are characterized as proactive and oriented towards risk-taking, are more likely to generate innovation, indicating impact of entrepreneurial orientation (EO) on innovation. The same result is confirmed by Zortea-Johnston et al., (2011) as they found that firms with EO create new markets/re-arrange existing ones by introducing new products or services as well as cause change in customers' behaviors. This type of firms provides superior customer value while leading their customers to learn new things. On the other hand, Knoppen et al., (2011) presented an extensive explanation and evidence of the primary role of absorptive capacity (ACAP) in leading innovations within a relational context.

The positive effect of customer integration on product innovation (PRDI) has long been established. According to empirical research, the integration of customer contributions in new product development (NPD) results in a superior level of product newness, minimized risks of innovation and more accurate resource spending (Sandmeier et al., 2010). Further, Baker and Sinkula (2005) reported a direct effect of market orientation (MO) on new product success and profitability and they related this to the firm's stress on the application of timely market intelligence to the decision-making processes.

2.5 Technological Innovation within SMEs

SMEs represent over two-thirds of the companies around the globe. This type of companies is deemed to be actual economic engines that significantly contribute to the country's economic growth (Ar & Baki, 2011; Costică, 2013). The significance of innovation for SMEs became evident with the heightening pressure experienced in the period of the 1980s and 1990s by firms owing to the entry of new competitors from international markets, and it is based on firms that focused on the manufacture of specific products that are geographically clustered in European countries (Parrilli & Elola, 2011). Thus, technological innovation (product/process) became the main key to survival and enhancement in various innovative activities of SMEs (Guo & Shi, 2012).

SMEs possess certain features, including: less bureaucracy, higher tendency to take risks, possession of more specialized knowledge and faster reactions to the dynamic market demands. These characteristics allow SMEs to gain from external knowledge more effectively compared to their larger counterparts (Bigliardi & Dormio, 2009; Westerberg & Frishammar, 2012). Thus, they will have a significant effect on growth and innovation activities. In addition, SMEs can take advantage of financial preferential policies (Guo & Shi, 2012).

Further, SMEs are intrinsically characterized as being more innovative, particularly in the early phases of the industry lifecycle (Bakar & Ahmad, 2010; Bouncken & Kraus, 2013). Smaller firms have a higher tendency to interact more with their customers, be more flexible and more proactive compared to

larger firms. These differences could prove significant for examining MO's role in smaller firms (Ar & Baki, 2011; Raju et al., 2011). Hence, small and large firms are good at various types of innovation according to their strengths and weaknesses (Pullen et al., 2012).

Academic literature, however, refers to two main sources of innovation: external source and internal source. With regards to the first, customer needs and business partners constitute the most important source as revealed by an IBM study. In addition, consultants, suppliers, competitors, associations, academia, laboratories and other institutions (Ramadani & Gerguri, 2011), trade fairs and exhibitions (Kamal & Flanagan, 2012) are also important external sources of innovation, particularly for SMEs, owing to their limited labs and lack of significant financial resources. This type of firms can take recourse by creating alliances with universities and research centers to obtain contemporary information (Laforet, 2011). Drucker (2002) claimed that demographic changes, perception and attitude changes and new knowledge are important opportunities for innovation.

Internal source, on the other hand, refers to the second spring for innovation, like internal R&D, employees, internal activities (Ramadani & Gerguri, 2011). Additionally, learning from long experience and from failure is a significant source of innovation (Boguslauskas & Kvedaraviciene, 2009; Kamasak & Bulutlar, 2010). In addition, other internal sources of innovation include unexpected occurrences, incongruities and process needs (Drucker, 2002).

Some SMEs may face some barriers in the form of lack of skills and knowledge to adopt modern management methods and current technologies coupled with lack of market orientation (Jones & Rowley, 2011; Pullen et al., 2012). For their survival, these businesses have to create mechanisms to identify, acquire and exploit new knowledge (Otero-Neira et al., 2013).

Accordingly, most SMEs are seeking to fill the internal deficit by using knowledge located external to its borders (Celuch & Murphy, 2010; Muscio, 2007). The organization'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 (Muscio, 2007). Such ability improves the capability of the SME to react to customer's needs that requires risk-taking and proactive methods (Boso et al., 2012a; Huang & Wang, 2011).

According to Zortea-Johnston et al., (2011), SMEs that are able to adopt entrepreneurial orientation (EO), develop new products or services, extend their operations to new markets and determine new growth sources, allowing them to move quickly in identifying product or service ideas that may generate competitive advantage over their rivals. This is particularly true as SMEs are not as likely to possess formal R&D and market research capabilities compared to their larger counterparts (Celuch & Murphy, 2010). Along these lines, Jones and Rowley (2011) revealed that SMEs' market orientation (MO) largely depends on marketing knowledge of the small business owner, who is more

likely to be a specialist as opposed to having managerial or marketing skills. It is therefore crucial for SMEs to combine customer, technology and learning capabilities to serve customer needs with their limited resources (Muscio, 2007; Otero-Neira et al., 2009).

2.6 Entrepreneurial Orientation Conceptualization

In 1973 Mintzberg was the pioneering scholar to acknowledge the use of an entrepreneurial organizational. But it was not until Miller (1983)'s work about entrepreneurial firms drew the attention of scholars (Todorovic & Ma, 2008; Wales, Gupta, & Mousa, 2011).

Entrepreneurial orientation (EO) is described as the firms' strategic orientation that encapsulates certain aspects of entrepreneurship of decision-making patterns, working methods and their managerial practices. In addition, it represents the firm's priority when it comes to the identification and exploitation of opportunities found in the market (Baker & Sinkula, 2009; Huang & Wang, 2011; Mahmood & Hanafi, 2013; Pérez-Luño et al., 2011). Owing to the significance of entrepreneurship to the performance of firms (e.g., firm innovation) (Huang & Wang, 2011; Hughes, Hughes, & Morgan, 2007), EO could be significant measure of the pathway through which a firm is structured and organized, and a mean to improves the achievement of firm's resources that are based on knowledge by concentrating on the use of such resources for the discovery and exploitation of new opportunities. Thus, EO underlies the process followed by the managers that enable firms to stay

advanced over their rivals (Al-Swidi & Mahmood, 2012; Lumpkin & Dess, 1996; Wiklund & Shepherd, 2003).

Entrepreneurial opportunities stem from innovation and technological changes, industrial crisis, changes in demography and macroeconomics (Boso et al., 2012a; Zahra, 2008). EO plays the role of firm's behaviors and beliefs, stressing on the proactive acquisition of entrepreneurial opportunities and creating innovation (Al-Swidi & Mahmood, 2012; Bakar & Mahmood, 2014; Huang & Wang, 2011).

Hence, EO has potential positive implications to the firm. The contraction of product lifecycles produces uncertain future profit threat, which drives present operations and businesses to look for novel opportunities constantly, and EO may be invaluable in such a process. In addition, entrepreneurial firms develop and launch new products and technology which may produce superior performance and may be attributed as the engine of development of the economy (Avlonitis & Salavou, 2007; Hughes et al., 2007). Entrepreneurial firms can develop first-initiative preferences, target advanced market sections and observe the marketplace before rivals. They are control the market through their hold on channels of distribution and establishment of brand recognition (Wiklund & Shepherd, 2003).

2.6.1 The essential components of entrepreneurial orientation

Danny Miller (1983) stated in his seminal article that an entrepreneurial firm is one that is involved in product-market innovation, takes on risky ventures and

is the first to create proactive innovations ahead of its competitors. Miller, in his work, posited three characteristics, namely: innovation, proactiveness, and risk-taking as the core of EO and they are often taken together to develop a higher-order reflection of firm-level entrepreneurship (Miller, 1983; Todorovic & Ma, 2008; Wales et al., 2011). These characteristics are explained in detail below:

2.6.1.1 Innovativeness

Innovativeness represents an inclination to advocate new ideas, novelty, and creative processes, through which firms can learn from prior practice and technology (Lumpkin & Dess, 1996; Morris et al., 2007; Boso et al., 2012a). It is considered as one of the significant factors impacting business performance. Innovativeness is described as a concept that is demanding increasing attention from researchers as well as practitioners as it signifies the degree of innovativeness contained in every novel product (Avlonitis & Salavou, 2007).

The relationship between innovativeness and innovation has been studied extensively in prior research (Baker & Sinkula, 2009; Laforet, 2011; Pullen et al., 2012). Authors (Ar & Baki, 2011; Grinstein, 2008a) have also claimed that innovativeness calls for considerable learning effort/experience about customers and as a result, to apply innovation in their processes, firms should possess sufficient information concerning their customers.

2.6.1.2 Proactiveness

This refers to expecting and reacting to future needs of customers and market, and thus developing a first-initiative preference compared to rivals (Baker & Sinkula, 2009; Kropp, Lindsay, & Shoham, 2006; Lumpkin & Dess, 1996). Due to this reason, proactive firms take advantage of opportunities that emerge in the market place. Thus, proactiveness is significant to EO as it indicates an advanced perspective coupled with innovative activity and taking of risks (Blesa & Ripolles, 2003; Huang & Wang, 2011; Renko et al., 2009).

Proactive firms expend efforts on environmental observation and monitoring in an attempt to find new trends and stay ahead of the competition (Pérez-Luño et al., 2011; Zahra, 2008) that is dynamically linked to market signal responsiveness (Hughes et al., 2007). Proactiveness can generate capacities that allow firms to come up with unique products/new markets far ahead of their rivals and the customers' expectations (Li et al., 2008). This is significantly affected by the explicit product-market strategy and the leader's personality (Miller, 1983).

Proactiveness indicates entrepreneurial inclination to be ahead of competitors through both proactive and offensive moves combined; for instance, launching new products/services before rivals and anticipating future demand to bring about change.

2.6.1.3 Risk-taking

Risk-taking is related to a tendency to appropriate considerable resources to high-risk projects (Baker & Sinkula, 2009; Huang & Wang, 2011; Otero-Neira et al., 2013). It indicates committing resources to projects with ambiguous outcomes. On the whole, it represents the firm's tendency to deviate from the normal path and travel through the unknown (Wiklund & Shepherd, 2003; Zahra, 2008). In this regard, risk has three aspects, namely: risk-related with exploring the unknown without being aware or knowing of the success probability; risk related to investing significant resources into a risky project; and personal risk arising from potentially unfavorable career implications if these projects are unsuccessful (Lumpkin & Dess, 1996; Pérez-Luño et al., 2011).

Moreover, innovation is primarily risky owing to the potential failure of the new offerings (Ko & Lu, 2010; Kohli & Jaworski, 1990; Wales et al., 2011; Zahra, 2008), particularly in the case of SMEs (Jones & Rowley, 2011). Unless the firm is inclined to face such failure, it will steer clear and refrain from such activities. Innovation generation is linked to steep learning curves which refer to the ability of the firm to obtain new operational knowledge (Zahra & Hayton, 2008; Pérez-Luño et al., 2011). While the potential for success is uncertain and low, successful activities will bring in financial rewards in the short- as well as the long-terms (Atuahene-gima & Ko, 2001; Lumpkin & Dess, 1996; Pérez-Luño et al., 2011). Therefore, firms possessing an entrepreneurial orientation (EO) are mostly characterized by risk-taking behavior, like incurring debts or

making large resource appropriation in order to obtain high returns by taking advantage of market opportunities.

Similarly, Lumpkin and Dess (1996) brought forth another two dimensions, namely: competitive aggressiveness and autonomy. These two dimensions go beyond the former three and provide a better description of the EO domain.

Lumpkin and Dess described competitive aggressiveness as the efforts of the organization to overtake its market antagonists through the maintenance of a confrontational stance; and autonomy as the ability of the organizational members to independently promote promising entrepreneurial ideas and plans (Baker & Sinkula, 2009; Wales et al., 2011; Zellweger et al., 2011).

However, researchers have argued that the competitive aggressiveness dimension overlaps with the proactiveness concept, whereas, autonomy is argued as being a contextual variable that fortifies entrepreneurial activities. That is way the three dimensions namely; innovativeness, proactiveness and risk-taking, have been relied on considerably in studying entrepreneurial orientation (EO) (Blesa & Ripolles, 2003; Huang & Wang, 2011; Kropp et al., 2006; Morris et al., 2007). In addition, Miller's scale was basically constructed and labeled depending on what theoretical concept was proposed, while the Lumpkin and Dess scale was built on what the factors analyzed revealed in their environment (Covin & Wales, 2012). As such, this study adopts the three main components for the reasons that set out above.

2.7. Absorptive capacity conceptualization

External knowledge transfer has been receiving increasing interest among researchers for the past five decades (Sparrow, Tarkowski, Lancaster, & Mooney, 2009). Following the seminal contributors (Cohen & Levinthal, 1990), the concept of absorptive capacity has emerged and has been used successfully in several studies investigating knowledge transfer among organizations (Andersén & Kask, 2012; Flatten, Greve, & Brettel, 2011).

In theory, external knowledge transfer stems from the fields of dynamic capability, organizational learning and knowledge management (Messinis & Ahmed, 2013; Smith, Graca, Antonacopoulou, & Ferdinand, 2008). While the concept calls for the realization and acquisition of knowledge from the environment, specifically from acquisitions and other inter-organizational relations, it also highlights the internal processes of learning from prior experience and present actions (Cohen & Levinthal, 1990; Gebauer et al., 2012; Smith et al., 2008).

A wide stream of literature (Andersén & Kask, 2012; Andersén, 2012; Martinkenaite, 2012; Tseng et al., 2011) has defined absorptive capacity (ACAP) as the capability to recognize, assimilate and apply external knowledge. In addition, Zahra and George (2002) provided another turn to this concept by categorizing ACAP structure into two dimensions, namely: potential ACAP (the capability for knowledge acquisition and assimilation); and realized ACAP (the knowledge transformation and exploitation). Moreover, they added

that the transition from assimilation phase to transformation phase is considered as a shift from potential ACAP to realized ACAP.

However, one of the main drawbacks of ACAP highlighted in literature is that only few attempts have been made to measure it out the context of R&D (Chalmers & Balan-Vnuk, 2012; Muscio, 2007). Notwithstanding, Zahra and George (2002) work has been tested by various studies and deemed to be suitable to explain the ACAP mechanism. The present research is in agreement with the dimensions proposed by Zahra and George's study. Scholars possessing different points of view have debated ACAP (Iii et al., 2009; Sparrow et al., 2009). ACAP is a dynamic capability comprising four various organizational capabilities, namely: acquisition, assimilation, transformation and exploitation. Meanwhile, Caccia-Bava, Guimaraes, and Harrington (2006) provided insight to ACAP by defining it as the organization's ability to estimate the significance of new knowledge and its assimilation and application to productive results.

Therefore, on the basis of the above discussions and Zahra and George's study, the present study defines absorptive capacity (ACAP) as a set of capabilities and qualifications of the firm by which it acquires, assimilates, transforms and exploits external knowledge from various partners and integrates it with previous knowledge to generate a dynamic capacity for innovation. Hence, in light of the debates above, ACAP includes four essential components, as follows:

2.7.1 Knowledge Acquisition

This is described as the capability of the firm to acknowledge, diagnose and acquire distinct knowledge that is produced externally and is crucial to its activities (Jiménez-Jiménez & Valle, 2011; Jung-Erceg et al., 2007). Acquisition poses several opportunities for firm regeneration; for instance, through the capability of acquisition, firms can obtain specific knowledge and skills that may have been already developed in their rival firms. In addition acquisition facilitates the obtaining of ownership along with new knowledge and capabilities that are owned by the acquired firms (Kostopoulos et al., 2011; Martinkenaite, 2012).

Moreover, a great level of openness for knowledge assets sharing is being witnessed in the industry even at the small firms level and this contributes to knowledge acquisition (Hurmelinna-Laukkanen, 2012; Liao et al., 2003). This is brought about by the dynamic changes in the manufacturing technologies, urging firms' participation in knowledge acquisitions (Amiryany, Huysman, Man, & Cloodt, 2012). Acquisitions of new knowledge can bring in value to the firm's competitive advantage as innovation of specified organization is enhanced through the obtained knowledge (Deng, 2010; Miczka & Größler, 2010). This in turn, enhances both organizational performance and internal R&D to produce new knowledge (Liu, 2010).

Studies in the marketing field view the interactions among firms and their customers and suppliers as a source of acquiring external knowledge in an attempt to produce offerings of higher value for both sides (Kristensson, Gustafsson, & Witell, 2011; Liao, Welsch, & Stoica, 2003a; Ngo & O'Cass, 2013). These studies acknowledge the value of such relationships by stating that firms maintaining an extensive and active network comprising external parties, will become aware of each other's distinct competencies and knowledge and this will increase their tendency to develop ACAP (Kostopoulos et al., 2011).

2.7.2 Knowledge Assimilation

This refers to the capability of the firm to process, analyze, explain and understand the information, knowledge and skills obtained from external sources (Flatten, Greve, et al., 2011; Kamal & Flanagan, 2012). Assimilation process, as the vivid evolution of knowledge (Yolles, Fink, & Dauber, 2011), is deemed to be a crucial element in organizational learning and a core factor for competitive advantage (Fletcher & Prashantham, 2011). This is owing to the fact that organizations make relationship with other parties to obtain distinct and strategic resources as well as to improve learning at the inter-organizational level (Jung-Erceg et al., 2007). The organization's assimilated knowledge is not confined to one individual but it hinges on interactions and knowledge sharing among many individuals (Caccia-Bava et al., 2006).

In other words, it is individuals and not organizations who transfer knowledge although the former requires access to certain organizational resources (Sparrow et al., 2009). This communication among individuals and groups brings about knowledge assimilation that enables organizations to obtain new knowledge that are externally generated (Fletcher & Prashantham, 2011). In this context, Hurmelinna-Laukkanen (2012) stressed on the ACAP's need for a participating value network in which knowledge is exchanged among individuals and ideas are refined.

2.7.3 Knowledge Transformation

This is primarily described as the capability of the firm to integrate the newly obtained knowledge with prior knowledge through an array of procedures that facilitate the use of integrated knowledge (Camisón & Forés, 2010; Flatten, Greve, et al., 2011). According to Martins (2012), knowledge transfer is a process indicating integrated dual ties between the knowledge source and the knowledge recipient. Organizations attempt to acquire tacit as well as explicit knowledge (Fletcher & Prashantham, 2011), as these forms are invaluable in creating new knowledge and they are complementary to each other (Kamasak & Bulutlar, 2010). Moreover, with regards to transforming knowledge from tacit to explicit or vice versa, it is reflected in the individuals/groups' interaction that can encapsulate the release of individual's tacit knowledge into the shared documents and explicit textual knowledge can be reflected upon (Feghali & El-Den, 2008). Nevertheless, not all knowledge transfer has successful and assured outcomes (Martinkenaite, 2012) because ideas and

knowledge sharing which take place behind the organization's search area are condoned as they are not easily graspable (Han & Erming, 2012).

Further, the relationship between various parties influenced by the advantages may facilitate collaboration (Andersén & Kask, 2012). Therefore, in order to obtain knowledge, an organization has to share knowledge (Kamasak & Bulutlar, 2010), where the issue is not concerning undeveloped organizations or organizations operating with limited activities. Within this context, Andersén (2012) adds the concept of protective capacity which refers to the firm's capacity to sustain or minimize the velocity of decreasing rare knowledge assets through imitation of others.

Organizations may depend on various methods of knowledge transfer, including group problem solving as mechanisms to transfer new knowledge, particularly in inflexible and unpredictable situations where opportunity exists for knowledge creation (Sparrow et al., 2009). The transfer process of new knowledge is deemed efficient when the shared knowledge is retained and it raises the level of innovation (Martinkenaite, 2012; Martins, 2012). Researchers, such as Sparrow et al., (2009); Amiryany et al., (2012); and Martinkenaite (2012) contended that transferred knowledge between parties may not be efficient enough as the differences between the parties exist in terms of culture, educational backgrounds and fields of expertise. This is also because of the ambiguous nature of tacit knowledge which calls for close cooperation with an external knowledge source.

2.7.4 Knowledge exploitation

It basically means the capability of the firm to apply the transformed knowledge into its products and process for the maintenance of ongoing growth (Kamal & Flanagan, 2012; Welsch, 2003). It is assumed that the exploitation of current knowledge resources may lead to superior competitive advantage (Delmas et al., 2011; Martinkenaite, 2012). Nevertheless, some organizations may be capable of transferring knowledge but are not so skillful in knowledge exploitation (Andersén, 2012) owing to several obstacles, including organization's resistance to change, deficiency of effective knowledge sharing methods and the gap between the new external knowledge and the organization's prior knowledge (Iii et al., 2009; Srivastava & Gnyawali, 2011). Additionally, the existence of external knowledge is not enough to achieve successful absorption (Wang & Han, 2011).

In this regard, Hurmelinna-Laukkanen, (2012) stated that innovation does not hinge on knowledge alone but it also depends on its application. Therefore, the acquisition, retention, transference and application of knowledge shift the researchers' attention from knowledge analysis as a source to analyzing organization's capabilities that produce new knowledge internally and integrating this with other resources for innovation making (formally through coordination, formalization with partners or informally through socialization process) (Huang & Li, 2009; Martinkenaite, 2012). This process is based on the dual role of ACAP to produce knowledge internally, in order to facilitate an

organization's identification, absorption and assimilation of knowledge from external sources (Michailova & Jormanainen, 2011).

In this context, ACAP reflects the capability of the firm to search for required external knowledge and then integrate it with prior knowledge to satisfy market requirements; such capability calls for meeting the following specifications:

-Capable of diagnosing urgent external knowledge.

-Capable of taking advantage of this knowledge and combining it with prior knowledge; and

-Capable of activating this knowledge and directing it towards future innovation.

In other words, ACAP is the capability of organizations to skim the external knowledge and the effectiveness of its communication processes.

2.8 Market orientation conceptualization

The pioneering thesis concerning market orientation (MO) surfaced in the 1950s when Peter Drucker explained that customers are the core factor that preserve and protect the organization (Celuch & Murphy, 2010; Eris & Ozmen, 2012). At that time, several expressions, such as market focus or customer focus were employed to describe the concept (Foley & Fahy, 2009). After the significant contribution of Kohli and Jaworski (1990); and Narver and Slater (1990), many conceptual frameworks and empirical studies regarding MO have been proposed in literature and this has attracted the scholars' attention in the field of marketing (Tsiotsou & Vlachopoulou, 2011; Zhang & Duan, 2010).

Of these proposed frameworks, two major approaches stand out in MO literature. First, Kohli and Jaworski (1990) stated that MO is composed of three behavioral constructs: intelligence generation, intelligence dissemination and responsiveness. Under this approach, MO promotes the organization over its frontiers and facilitates the collection of information from the external environment and its dissemination to develop a good level of awareness to key players (Eris & Ozmen, 2012; Otero-Neira et al., 2013; Jing Zhang & Duan, 2010). Nevertheless, according to Lings and Greenley (2010), it is impossible for an organization to develop MO devoid of each employee's real inclination, clear understanding and the ability to interact in market-oriented behaviors and activities; or, without sharing information and knowledge from the external environment.

In the second approach Narver and Slater (1990) defined market orientation (MO) in a different take from what was put forth by Kohli and Jaworski. Their conceptualization concentrated on cultural factors, namely: customer focus, competitor's focus and inter-functional coordination (Grinstein, 2008b; Jiménez-Jimenez et al., 2008). Both approaches have been thoroughly examined in terms of their reliability in large firms by studies but are not of the consensus as to which method is dominant (Jones & Rowley, 2011). A significant number of studies attempted to define MO according to their points of view. These definitions are listed in Table 2.2.

Table 2.2
Market orientation definitions

Author (s)	Terminology	Adopted Definition
Malhotra, Lee, & Uslay, 2012 ; Tsiotsou & Vlachopoulou, 2011and Narver & Slater ,1990	Organizational culture	Refers to a business culture reflecting the set of values, attitudes and beliefs of the organization that maintains its competitive advantage by providing superior customer value.
Zebal & Goodwin, 2012	Organizational decision-making	Is considered as a process of collecting information concerning customers and competitors that are invaluable for the decision- making process.
Gellynck et al., 2012 and Lings & Greenley, 2010	Philosophy	Identifies the needs and desires of customers and adapts products/services to satisfy them, while emphasizing on promoting competition.
Sen, 2010	Strategy	Employed by organizations to achieve sustainable competitive advantage by analyzing markets, environments and competitors in order to realize superior customer value.
Kohli & Jaworski, 1990	Organizational behavior	Refers to a process of collecting and sharing information concerning buyers and competitors, in an attempt to obtain competitive advantage through superior customer value and ongoing processes of innovation.
Celuch & Murphy, 2010 and Foley & Fahy, 2009	Capability	That supports the attempts to gather and manage invaluable information from external stakeholders, including customers and competitors, in the hopes of better organizing internal activities.

Within the context of the present study, the behavioral attitude concept of Kohli and Jaworski is adopted to define MO as a process of gathering and sharing of substantial knowledge about buyers and competitors to obtain sustainable competitive advantage through superior customer value and continuous innovation processes.

2.8.1 The essential components of market orientation

This research depends on Kohli and Jaworski's approach to study market orientation (MO) comprising the following dimensions:

2.8.1.1 Intelligence generation

This is a process of collecting the needed information linked to customers' desires from the environment (Boso et al., 2012a; González-Benito, González-Benito, & Muñoz-Gallego, 2009). Additionally, it comprises an analysis of the way customers can be affected by government regulations, technology, competitors and other environmental factors (Chao & Spillan, 2010; Chung, 2012) to acknowledge potential market opportunities (Zahra, 2008).

2.8.1.2 Intelligence Dissemination

This pertains to knowledge sharing among various sections and firm members (Beck et al., 2011; Chung, 2012; Zhang & Duan, 2010) and the exchange of ideas produced from intelligence among departments and individuals in an organization through formal and informal methods (Chao & Spillan, 2010), both horizontal and vertical (Chung, 2012).

2.8.1.3 Responsiveness

This refers to the development and employment of all needed actions towards the generation and sharing of intelligence to satisfy customers' needs (Beck et al., 2011; Chao & Spillan, 2010; Chung, 2012; Grinstein, 2008b; Todorovic & Ma, 2008). It is related to performance and represents the speed and

coordination of the implementation and review of relevant actions (Chang et al., 2013; Welsch, 2003) that allow firms to be adaptive to challenges brought on by rivals (Lumpkin & Dess, 1996).

On the other hand, Jaworski, Kohli, and Sahay (2000) discriminated between two complementary concepts to the notion of MO: market-driven and market driving concepts. Both comprise MO and consider consumer, competitor and market conditions. Specifically, market-driven means learning, understanding and responding to the customers' perceptions and behaviors within a specific market structure; while market driving is the change in the structure and/or rules of the market participants, or their behavior (Blesa & Ripolles, 2003; Zhang & Duan, 2010).

Further, scholars have emphasized on the need to distinguish between the market otientation concept as an organizational behavior catered towards the development of value for present and potential customers (Kohli and Jaworski 1990); and marketing orientation as marketing function positioned at the top of an organizational structure (Sen, 2010).

2.8.2 The importance of market orientation

In market orientation literature, authors are of the consensus on the significance and benefits of employing the MO concept in organizations. Specifically, Grinstein, 2008b; and Tsiotsou and Vlachopoulou (2011) deemed MO as the internal strength that reinforces organizations in their achievement of

sustainable competitive advantage through the addition of superior customer value into new products and services (Zahra, 2008). This value can be achieved by understanding the present and potential customers' needs, organizational knowledge and abilities and external environment, including the entire departmental functions in customer-focused activities and strategies (Sen, 2010).

In addition, MO is deemed to motivate the generation of new knowledge regarding customers and competitors, and in turn, this results in knowledge values (Grinstein, 2008b; Jiménez-Jimenez et al., 2008). It is an important enabler of competitive advantage, particularly in the case of SMEs (Celuch & Murphy, 2010; Zahra, 2008). This is because an organization's sustainable competitive advantage stems from an integral group of crucial internal and external assets, and MO produces such advantage (Jiménez-Jimenez et al., 2008), which leads to the development of shared values, products and services that promote growth (Cheng et al., 2012). This is the reason why market-oriented organizations exist and survive (Tsiotsou & Vlachopoulou, 2011).

Many factors are attributed to the increasing role and importance of MO and they; produce the dynamic change in customers' needs and desires, globalization, increased competition and level of complexity and international trade volume, distribution channels complexity and rapid information dissemination (Grinstein, 2008a; Lee & Tsai, 2005; Liao et al., 2003a; Malhotra et al., 2012).

Based on the above discussion, it can be concluded that MO has become a crucial element for organizations, particularly as a means to accumulate knowledge through the activation of previous knowledge and its combination with new knowledge obtained from the external environment. This adds new value to customers, improves the process of innovation and promotes competitive advantage.

2.8.3 The mediation role of market orientation

There is an important claim pertaining to the role of MO in the marketing literature, in terms of its achieving superior business performance and competitive advantage over rivals (Grinstein, 2008b; Zebal & Goodwin, 2012). According to Lin et al., (2008); and Cheng et al., (2012), MO is a critical antecedent to understand changes in customers' attitudes and competitors' moves, and thus, market information gathered from customers and competitors may be considered as external drivers that promote innovation. In this regard, Gaur et al., (2011) stated that innovation of new products is partially encouraged by competitors' innovations and customers' demands.

MO also assists organizations in reconfiguring resources to provide customers added value by employing competitive, differentiated and appropriate marketing programs (Hong et al., 2013; Taghian, 2010). Thus, when customers are satisfied with the added value in products/services, they are likely to conduct repurchase activities (Zebal & Goodwin, 2012).

However, there are some major requirements to be taken into consideration in order for market orientation (MO) to thrive and be effective (Lin et al., 2008; Raju et al., 2011). A commonality between entrepreneurial orientation (EO) and MO is their emphasis on learning. Three antecedents of MO have been identified by Kohli and Jaworski (1993). First, top management's enhancement of the significance of MO and knowledge sharing to realize suitable reactions to market needs; second, the examination of the way the organizational departments interact to influence MO; and finally, possession of an organizational structure that supports MO. This indicates that understanding customers' and market needs is insufficient to achieve effective MO without a high level of EO (González-Benito et al., 2009; Ramayah et al., 2016; Zahra, 2008).

Customer and market information gathering could be necessary for achieving strong MO (Baker & Sinkula, 2009); hence, learning from customer needs and competitor behavior is deemed to provide a crucial input to the process of innovation (Otero-Neira et al., 2013). An efficient MO demands a commitment to acquisition of externally generated knowledge (Slater & Narver, 1995; Baker & Sinkula, 1999). Both MO and knowledge acquisition are similar conceptually, as they are both linked to the market-information-processing activities of the organization along with the values and norms driving the behaviors (Baker & Sinkula, 2007).

It can be stated that MO is necessary in entrepreneurial firms to facilitate an environment conducive to innovation (Eris & Ozmen, 2012; Jiménez-Jimenez et al., 2008; Otero-Neira et al., 2013). Organizations need to align their strategies with the internal resources and capabilities to maintain competitive advantages and realize superior performance (Gaur et al., 2011; Grinstein, 2008b). For instance, organizational capabilities are needed to obtain and exploit external knowledge representing a great drive of internal innovation (Lin et al., 2008). Along these lines, Chang et al., (2012) contended that improved employees' learning and firm's absorptive capacity (ACAP) can reinforce market responsiveness and firm innovation.

Thus, the increased dependence on prior knowledge about customers can guide firms in carrying out adaptive change that can lead to single loop of learning about their customers (Cohen & Levinthal, 1990). On the other hand, ACAP serves as a exploring tool, where change is related to acquiring external knowledge rather than a narrow internal view about the customers and their needs; when such changes acquire a new way of looking at the main issues and events, double loop of learning is supported (Slater & Narver, 1995; Sun & Anderson, 2010). Thus, market orientation (MO) can support the integrating relations between learning loops through its effect on the relationship between ACAP and technological innovation capabilities (TIC).

Depending on the above propositions, it can infer that MO has a direct impact on innovation through the understanding of customer and market needs and offering valued and differentiated products and services to satisfy these needs. Inversely, there are indispensable antecedents for MO represented in the firm's resources and capabilities, particularly those capabilities related to firm's proactiveness to the requirements of customers and market, the level of organizational innovativeness and its ability to take risks .In addition, these operate on acquisition of external knowledge and exploit it to support TIC.

2.9 Underpinning Theory

The resource-based view (RBV) of the firm is increasingly becoming popular in the field of strategic management, marketing, organizational theory and other fields over the past few decades (Foss & Ishikawa, 2007; Galbreath, 2005; Mathews, 2002).

The RBV theory has become a dominant theory that has been considered as the basis for arguments in academic journals and textbooks. One of the pioneering scholars to acknowledge the significance of firm's resources in its competitive position is Edith Penrose in 1959. According to her, the firm's growth (internal and external) brought about through merger, acquisition and diversification, is largely dependent on the way it employs its resources (Newbert, 2007). In reality, the RBV theory was first introduced in literature by Wernerfelt in 1984, developed from the view that the success of the firm is determined by its owned and controlled resources (Andersén, 2012; Galbreath, 2005).

Resources are viewed as inputs to the production process of the firm (Barney, 1991; Barney, Mike, & Ketchen, 2001) that can be distinguished as knowledge-based resources (KBR) and property-based resources (PBR) (Galbreath, 2005). KBR may be important in generating sustainable competitive advantage as they are inherently inimitable and hence, facilitate sustainable differentiation (Galbreath, 2005; Huang et al., 2011; Martín-de Castro et al., 2013); play a significant role in the entrepreneurship of the firm and enhance performance (Wiklund & Shepherd, 2003). While KBR are methods by which firms combine and transform tangible input resources, PBR commonly refers to the tangible input resources (Galbreath, 2005; Mathews, 2002).

Capabilities can also be categorized on the basis of the type of knowledge encapsulated within them. Functional capabilities enable a firm to create technical knowledge, whereas integrative capabilities enable it to obtain knowledge from its external connections and combine the several technical competencies created in different departments of the firm. Innovation capability refers to higher-order integration capability; in other words, it is the ability of the firm to form and manage its different capabilities. Such a concept of higher-order integration capability is created where firms that possess it are able to combine major capabilities and firm resources for innovation development (Cohen & Levinthal, 1990; Jung-Erceg et al., 2007; Lawson & Samson, 2001; Narvekar & Jain, 2006; Zhou et al., 2010).

The RBV assumes that the firms with specific resources and capabilities with distinct characteristics will achieve competitive advantage, and in turn, achieve optimum performance. The RBV describes capability as the dissemination and the rearrangement of resources in order to enhance productivity and meet a firm's goals (Camisón & Villar-López, 2012b).

Literature is full of definitions for the terms 'resources' and 'capabilities' but for the purpose of the present research, both terminologies are interchangeably used (Kropp et al., 2006; Ray, Barney, & Muhanna, 2004).

Basically, resources refer to the productive assets of the firms, through which they achieve their activities (Galbreath, 2005; Kropp et al., 2006; Mathews, 2002). Similarly, it has also been defined as bundle of entities; for instance, knowledge, physical assets, human capital and other tangible and intangible resources that are firm-owned and controlled, which are then transformed into final products or services in an efficient and effective manner (Bakar & Ahmad, 2010; Lavie, 2006).

Moreover, the connotation of organizational capabilities originates from the RBV of the firm (Barney et al., 2001). Thus, organizational capabilities refer to the attributes of the firm that allow it to coordinate and use its resources (Nasution & Mavondo, 2008).

In the field of technological innovation capabilities, the RBV has a prominent position. According to researchers, the firm's heterogeneous resource portfolios comprising of human capital and technological resources are associated with observed variability in its financial returns. Such resources are considered as the firm's core competencies that substantially add to the sales growth and competitive advantage of the firm (Lau, Yam, & Tang, 2010).

Innovation capabilities' concept originated in the theory of organizational capability and is considered as a new notion that matches the RBV of the firm, where the RBV posits that firms optimally exploit their resources (Börjesson et al., 2014). In this scenario, innovative capability refers to the firm's ability to innovate from a RBV at the firm level (Zhou et al., 2010).

More importantly, technological innovation capabilities (TIC) are major origins of competitive advantage for the firm where successful technological innovations hinge on technological capability and other critical capabilities from the aspects of manufacturing, marketing, organization, strategic planning, learning and appropriation of resources (Guan et al., 2006).

In investigating the capabilities and resources of manufacturing companies, the RBV has revealed that competitive advantage in manufacturing is impacted by the processes and equipment's suitability. Moreover, external and internal learning play a key role in the firm's maintenance of competitive advantage (Kim et al., 2009). It can therefore be stated that innovation may entail various

changes depending on the resources and capabilities of the organization (Baregheh et al., 2009).

The RBV postulates that enterprises are groups of resources that are distinct throughout firms and industries, persisting over time. Distinct resources and their interactions result in a sustainable advantage and hence, innovations may be defined as the new combinations of existing and/or new resources and capabilities (Inauen & Schenker-Wicki, 2011).

Prior researches based on the RBV theory have highlighted that entrepreneurial orientation (EO) as one of the top resources that brings about the innovation of the firm (Bakar & Ahmad, 2010; H.-C. Huang et al., 2011; Kropp et al., 2006; Todorovic & Ma, 2008; Wales et al., 2011; Weerawardena & Coote, 2001). They contended that EO can be considered as a resource which improves firm's success. Moreover, other researchers (Diaz-Pichardo, Cantu-Gonzalez, Lopez-Hernandez, & McElwee, 2012) have contended that the firms compete successfully with their development and they will maintain distinct capabilities to enable them to partake of the opportunities and minimize risks.

Along the same line of discussion, absorptive capacity (ACAP), a type of KBR, is considered as the function of the organization's existing resources, tacit and explicit knowledge, internal routines, management competencies and culture (Andersén, 2012; Martinkenaite, 2012). This is likely to be reflected in the development, experience and motivation of the owner/manager of the SME and

its key staff members (García-Morales et al., 2013; Gray, 2006; Lin & Wu, 2013). Despite the fact that SMEs own limited resources, some of them are distinct and in a suitable position in comparison to their rivals to develop valuable products for consumers and provide the most optimum wealth creation (Celuch & Murphy, 2010; Gallego et al., 2012).

On the basis of prior studies, a firm's ACAP explains the actual learning it undergoes from partners and consequently, this contributes to the performance of the firm (Lavie, 2006). This represents ample opportunity for knowledge acquisition and exploitation by interacting with other firms; in other words, firms are able to access a pool of knowledge that is valuable and inimitable (Nagati & Rebolledo, 2012).

In a related study, Liao et al., (2010) contended that if an organization is viewed as an organic system, then knowledge will be the input, the absorptive capacity (ACAP) will be the process and innovation will be the resulting output.

According to the RBV theory, the firm's product development strategy and its use of knowledge can be viewed as unique intangible resources that can lead to competitive advantage (Barney, 1991;Zhang et al., 2009).

Moreover, researchers in the field of market orientation (MO) have employed the RBV theory as the basis of their discussions. Specifically, Taghian (2010) stated that MO is a significantly intangible resource owing to its core functions. Similarly, Hult and Ketchen (2001) built on the RBV of the firm and posited that MO is among several capabilities that in combination may lead to the firm's positional advantage. Other authors have linked the RBV to the philosophy of marketing and indicated that market-driven organizations tend to possess superior outside-in capabilities like market-sensing, customer linking, and channel bonding capabilities (Baker & Sinkula, 2005; Kim et al., 2013).

Researchers have also claimed that a positive association exists between market orientation (MO) and firm's activities in its market-sensing capability, such as market information acquisition, dissemination, interpretation and storage (Kropp et al., 2006; Olavarrieta & Friedmann, 2008). Ketchen, Hult, and Slater (2007) presented their current views concerning RBV and shed light on how the strategic resources (such as MO) have potential value, and that acknowledging this value calls for alignment with other significant elements in the organization. Chen and Tsou (2012) employed the RBV to examine the interactive manner with customers and the importance for firms to share resources and capabilities and develop novel products/services.

In sum, prior studies, such as Galbreath (2005); and Stock and Zacharias (2010) have claimed that market orientation, entrepreneurial orientation and absorptive capacity all contribute towards the innovation of the firm. In other words, the

association between resources and firm innovation lies in the interconnected web of resource relationships.

2.10 Theoretical framework

After the development of research problem, questions and objectives and reviewing the relevant literature, the research's theoretical framework as in Figure 2.1 is developed. This framework aims to explain the influence of entrepreneurial orientation, absorptive capacity, and market orientation on technological innovation capabilities among industrial SMEs. Previous scholarly works have equally shown the importance of firms' ability for knowledge absorption from outside their borders and activate this knowledge in a proactive and innovative response to the latent customers' needs in fostering firms' innovation (Hult & Ketchen, 2001; Grinstein, 2008a; Johannessen & Olsen, 2011; Messersmith & Wales, 2011; Otero-Neira, Arias, & Lindman, 2013; Wang & Chung, 2013). In addition, they highlighted the necessity for both entrepreneurial orientation (EO) and absorptive capacity **(**ACAP) to increase innovation especially for the industries with low and medium technology (Grinstein, 2008b; Jantunen, 2005; Sciascia, D'Oria, Bruni, & Larrañeta, 2014).

In terms of research justifications, there is still a considerable gap caused by the scarcity of previous empirical efforts, and scattered related studies. Hence, this research is expected to make a significant contribution to both academic and practical dimensions. Providing a framework for technological innovation

capabilities antecedents will deepen the understanding of future academic researchers during their endeavors in researching the same area. Moreover, it can encourage the firms to adopt innovation activities by highlighting the factors that may affect technological innovation capabilities.

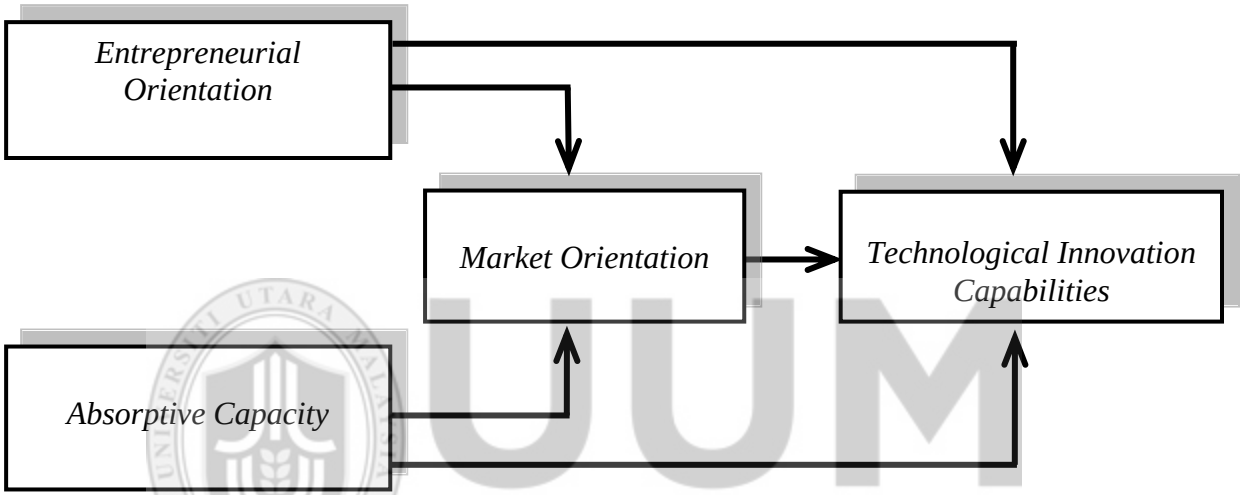

Figure 2. 1 Theoretical Research Framework

The proposed framework in Figure 2.1, underpinned by the RBV theory (Barney, 1991) can demonstrate how firms can achieve and maintain technological innovation capabilities. Based on this theory, maintaining competitive advantage is a result of a firm's resources or capabilities that are invaluable, scarce, imperfectly imitable, and irreplaceable (Barney et al., 2001), because a superior assortment of mixed resources assists the firm in adapting to the conditions of uncertainty and risk in innovation (Srivastava & Gnyawali, 2011). Thus, these resources and capabilities have considerable meaning to direct a firm's innovation efforts (Zhang, Wu, Zhang, & Zhou, 2009). Furthermore, Lin and Wu (2013) reported that the use of the RBV analyses may show the similarity between innovation strategies in SMEs and large firms.

The researcher understands that the firm's ability to increase the utilization of these resources depends on the availability of these resources at a given time, but creating a joint utilization of such resources efficiently has been debated as significantly impacting on the firm's innovative activities.

2.11 Hypotheses Development

Based on the theoretical framework variables, the research hypotheses are developed to test the relationships between (entrepreneurial orientation, absorptive capacity, and market orientation) as antecedents to technological innovation capabilities. In addition to investigating whether market orientation (MO) plays a mediating role between independent variables, namely: entrepreneurial orientation (EO) and absorptive

capacity (ACAP); and dependent variable, technological innovation capabilities (TIC).

2.11.1 The Relationship between Entrepreneurial Orientation and Technological Innovation Capabilities

Firms can survive in the business environment due to the demand for their products and possessing certain resources to compete with others. Miller (1983) showed that firm' strategies affected by owner personality and attitudes; and indicate that those confident owners-managers are most possible to be entrepreneurial.

Based on this notion, Huang and Wang (2011), through their work on promoting innovation levels in SMEs, considered innovation as entrepreneurial orientation (EO) outcome. Empirical evidences have shown that understanding EO as one of the crucial resources of the firm, has a significant impact on the firm's ability to adapt to environmental changes through the provision of different types of innovation (Hong et al., 2013; Li et al., 2008; Loi, Lam, Ngo, & Cheong, 2013; Pérez-Luño et al., 2011; Ramayah et al., 2016; Zortea-Johnston et al., 2011). As indicated by the relevant literature, a firm that has EO is characterized by risk-taking, proactivness and innovativeness (Al-Swidi & Mahmood, 2012; Baker & Sinkula, 2009; Jones & Rowley, 2011; Miller, 1983; Ren & Yu, 2016; Wales et al., 2013) to be able to understand the requirements of both market and customers and satisfy these needs through new innovations (Baker & Sinkula, 2009; Bosoet al., 2012b; Messersmith &

Wales, 2011). Despite these arguments, Messersmith & Wales (2011) elucidated a non-significant relationship between EO and small firms' innovation. While, Atuahene and Ko (2001) gave an accurate depiction of the relationship that links entrepreneurial orientation (EO) with product innovation (PRDI); they argued that the main reason implied in this relationship is represented in one of the EO dimensions, which is a high level of innovativeness. Henard and Szymanski (2001), and Baker and Sinkula (2007) also reported that product innovation is strongly related to innovativeness. Other researchers have highlighted the role of other dimensions of EO, for instance, risk-taking can foster firm's ability to produce new products and processes (Abdul Aziz et al., 2014; Y. Chen, 2012; Cheng et al., 2012; Mahmood & Hanafi, 2013). A risk-taking nature promotes firms towards dedicating the necessary resources which can help in producing new innovations (Ko & Lu, 2010; Zhou & Tse, 2005).

Previous studies have also indicated a positive influence of proactiveness on innovation and value creation (Aljanabi & Noor, 2015b; Bakar & Ahmad, 2010; Pérez-Luño et al., 2011; Zellweger et al., 2011). Hence, EO plays an antecedent role for technological innovation capabilities (Bakar & Ahmad, 2010; Weerawardena & Coote, 2001), this leading to the following hypothesis:

H1: Entrepreneurial orientation is positively related with technological innovation capabilities.

2.11.2 The Relationship between Absorptive Capacity and Technological Innovation Capabilities

Firms seek external knowledge from different sources by using different mechanisms in a move to increase the levels of innovation (Foerstl & Kirchoff, 2016; Jung-Erceg et al., 2007; Weigelt & Sarkar, 2012). Many of the previous studies have supported the notion that absorptive capacity **(**ACAP) plays a direct role in achieving innovation (Gebauer et al., 2012; Hurmelinna-Laukkanen, 2012; Laforet, 2011; Mason-Jones & Towill, 2016; Tsai, 2001). Nevertheless, some researchers have found a non-significant relationship between knowledge acquisition and technological innovation among the industrial firms in Malaysia (Lee, Leong, Hew, & Ooi, 2013).

However, according to Caccia-Bava et al., (2006), absorptive capacity **(**ACAP) can help in fostering technological innovation (TI) facilely, and it can also determine the extent to which value can be created (Hurmelinna-Laukkanen, 2012; Ren & Yu, 2016) by identifying the rapidity, frequency and volume of innovation (Tseng et al., 2011). Within this context, researchers (Liao et al., 2010; Wang & Han, 2011) have reported that innovation depends on organizational ability to turn both internal and external knowledge into action and outcomes and does not depend on knowledge itself. Hung, Lien, Fang, & McLean (2010) noted that organizations attempt to merge knowledge by providing facilitative conditions to knowledge sharing between individuals and groups to achieve the highest level of innovation.

In a more detailed insight, acquisition of new knowledge as one of the absorptive capacity **(**ACAP) dimensions, can add value to an organization's competitive advantage (Mason-Jones & Towill, 2016; Miczka & Größler, 2010). The assimilation process, as a vivid evolution of knowledge (Yolles et al., 2011), is considered the essential component in organizational learning and an integral factor for competitive advantage (Fletcher & Prashantham, 2011). Moreover, transformation process has an essential role in achieving a firm's innovation (Hall & Andriani, 2003; Ren & Yu, 2016). In addition, exploitation of present knowledge can result in sustainable competitive advantage and promote innovation, because a firm's ability to innovate depends on its ability to exploit the available knowledge (Hurmelinna-Laukkanen, 2012).

Jantunen (2005) concluded that most relevant literature on innovation have confirmed the role of ACAP in utilizing external knowledge, or that ACAP influences innovation. This leads to the following hypothesis:

H2: Absorptive capacity is positively related with technological innovation capabilities.

2.11.3 The Relationship between Entrepreneurial Orientation and Market Orientation

Previous researches support the notion of a close interrelationship between entrepreneurial orientation (EO) and market orientation (MO) (Atuahene-gima & Ko, 2001; Blesa & Ripolles, 2003). The relationship between EO and MO is based on the idea that the market is the focus of attention of

EO (Zortea-Johnston et al., 2011). The dimensions of EO (innovation, risk-taking and proactiveness) try to meet the market changes, and at the same time, are influenced by the market itself. Researchers have also argued that the synergies between MO and EO fortify a firm's performance, as such suggesting an existence of relationship between the two themes (Newman et al., 2016; Slater & Narver, 1995; Todorovic & Ma, 2008; Zahra, 2008). Nevertheless, the result of Lin et al., (2008) study indicates a non-significant effect of EO on MO, which is the same result reached by Aljanabi and Noor (2015b).

SME owners/managers often work as brain (Covin & Miller, 2014). In other words, the more knowledge they have about the market, the larger the number of innovations they achieve, and this is done by devoting much of their time looking for information about the requirements of the market and customers (Classen et al., 2012; Miller, 1983). Thus, entrepreneurial orientation (EO) can increase information acquisition of a firm and utilization of this information to generate intelligence about the market (Keh et al., 2007). Cervera, Molla, and Sanchez (2001) proved the influence of entrepreneurship on intelligence generation and dissemination as dimensions of market orientation (MO). Grinstein (2008b) reported that entrepreneurially-oriented firms tend to possess a high level of MO. In view of the foregoing discussion, the following hypothesis is developed:

H3: Entrepreneurial orientation is positively related with market orientation.

2.11.4 The Relationship between Absorptive Capacity and Market Orientation.

Previous academic efforts have tried to link between absorptive capacity and market orientation through the main dimensions of these two constructs. As such, while firms in their quest for broad types of knowledge, acquisition process of knowledge as a dimension of ACAP, participates with MO the generation of knowledge concerning customers and markets (Flatten, Engelen, Zahra, & Brettel, 2011; Kohli, Jaworski, & Kumar, 1993; Kotabe, Jiang, & Murray, 2011).

Other researchers have reported that a firm's responsiveness and speed are affected by its ability to utilize the acquired knowledge, and thus sentient estimation of market alterations needs ACAP to transform related knowledge into valuable outcomes and deal properly with received signals from the market (Chang et al., 2013; Jantunen, 2005). Flatten, Greve et al., (2011) asserted that efficient ACAP can enable firms to respond faster to customers' preferences changes. A long with this line, Flatten, Engelen et al., (2011) demonstrated the relationship between knowledge exploitation and responsiveness, since they share a common goal of making a profit of knowledge. Weigelt and Sarkar (2012) illustrated that ACAP affects the way of interpreting and responding to the customers' and market information. Thus, the effect of ACAP on market orientation (MO) appears through its role in bridging the knowledge gap between the available knowledge stocks and the new

acquired knowledge to respond to changes in market conditions (Prieto & Revilla, 2006; Delmas et al., 2011).

In addition, firms with high ability to acquire and assimilate external knowledge are likely to reduce their dependence on market feedback as a unique way to develop products. In other words, such firms do not need direct indications from the market to guide them on how to develop their products and processes (Baker & Sinkula, 1999; Chang et al., 2013).

Further support is provided by Hult and Ketchen (2001) who recognized the importance of generation of new knowledge in stimulating the more proactive benefits of MO to achieve a higher degree of knowledge sharing within the firm. This notion has been supported by other researchers (Adhikari & Gill, 2012; Grinstein, 2008b; Hughes, Morgan, & Kouropalatis, 2008; Raju et al., 2011). Thus, the following hypothesis is posited:

H4: Absorptive capacity is positively related with market orientation

2.11.5 The Relationship between Market Orientation and Technological Innovation Capabilities.

Among innovation antecedents in the existing field of academic research, market orientation (MO) has often had a solid relationship with firms' innovative efforts (Aljanabi & Noor, 2015b; Boso et al., 2012a; Grinstein, 2008a; Olavarrieta & Friedmann, 2008; Cheng Lu Wang & Chung, 2013). The reason for this relationship goes back to the role of

MO in forming a deeper understanding of customers' needs and minimizing innovation failures (Al-Swidi & Mahmood, 2012; Atuahene-Gima, Slater, & Olson, 2005; Cooper, 1994). Because firms that possess a powerful MO are looking carefully to their customers' manifest wishes and react by developing products and processes to meet these wishes (Baker & Sinkula, 2007, 2009; Newman et al., 2016). Nevertheless, others have found non-significant relationship between MO and innovation (Blesa & Ripolles, 2003; Chao & Spillan, 2010). In a similar vein, Ferraresi, Quandt, Santos, & Frega (2012) reported that 23 out of 36 studies indicated significant effects between MO and innovation, while other studies did not demonstrate a similar result.

Researchers have noted that over time, new segments of customers appear to represent the focal point of firms. In this regard, Beck et al., (2011) argued that MO is positively linked to innovation because determining new customer segments results in development of new products to satisfy their needs. Therefore, market-oriented firms are more likely to engage in high level of innovation and new product development (Aljanabi & Noor, 2015a; Grinstein, 2008a), in addition to enhancing their ability to understand competitive situations (Jiménez-Jimenez et al., 2008).

More importantly, the association between knowledge and innovation (Nonaka, Toyama, & Nagata, 2000) may be one of the main reasons for the relationship between MO and innovation. As a dimension of MO,

intelligence-generation provides the firms with proper knowledge and deeper insight about customers' preferences, thus creating more obligation to develop new products and processes (Kim et al., 2013; Zhang & Duan, 2010). There is consensus among researchers about the effect of MO on innovation. Baker and Sinkula (2005, 2007) summarized the published researches for the period 1999 - 2003, which focused on the relationship between MO and innovation in more than 55 marketing journals; they concluded that all these researches support the positive MO-innovation relationship. In line with above arguments, the following hypothesis is formulated:

H5: Market orientation is positively related with technological innovation capabilities.

2.11.6 The Mediation role of Market Orientation

Past studies suggest that there is an integrative relationship between entrepreneurial orientation (EO) and market orientation (MO), while EO places greater emphasis on novelty and exploratory activities, MO is more on adaptive activities (Blesa & Ripolles, 2003; Boso et al., 2012a; Herath & Mahmood, 2013). Therefore, entrepreneurial activities can contribute to the development of new competencies by supporting the activities of MO and creating new opportunities to the existing business (Bhuian, Menguc, & Bell, 2005; Luo, Zhou, & Liu, 2005; Ramayah et al., 2016). However, researchers have discussed that EO affects firms' outcomes, like innovation, through specific resources and knowledge, but they did not investigate enough the underlying causal mechanisms

for such a relationship (Wales et al., 2011). In addition, Aljanabi and Noor (2015b) found an absence of mediation role of market orientation (MO) on the relationship between EO and technological innovation capabilities (TIC).

Furthermore, a focus on one of the two orientations and the exclusion of another may have negative consequences on a firms' competitive ability. For example, broad emphasis on explorative entrepreneurial efforts can confuse firms' existing capabilities, if these activities are exposed to failure; whereas, overemphasis on MO's exploitative operations may make it difficult for the firm to avoid the demanded customers (Boso et al., 2012b; M. Hughes et al., 2007; Newman et al., 2016). Hence, Blesa and Ripolles (2003) gave more attention to the effect of entrepreneurial proactiveness on new product success and they concluded that firms with high level of proactive behavior are more likely to be innovative through adoption of MO.

Cervera, Molla, and Sanchez, (2001) asserted the mediation role of MO in the EO-innovation relationship. In particular, Atuahene-gima and Ko (2001) discussed how EO and MO can be effectively integrated to stimulate new innovations. In a comparative multi-case study, Otero-Neira, Arias, and Lindman (2013) reported that the MO in entrepreneurial firms is conducive to produce innovation. That is because MO can be a platform to achieve innovation and such ability to exploit these opportunities depends on a firm's EO (Zahra, 2008).

With regards to the mediation role of market orientation (MO) in the relationship between absorptive capacity **(**ACAP) and technological innovation capabilities (TIC), Lee and Tsai (2005) asserted that without the ability to exploit the acquired knowledge, MO might not be positively related to new product development. Baker and Sinkula (1999) viewed acquiring and disseminating knowledge about markets and continually following-up on the dynamics of markets can be the catalytic engine behind MO to meet customers' satisfaction through innovative products.

Moreover, firm's ability to absorb external knowledge is one of the main resources on which MO depends to apply this knowledge for commercial ends (Jiménez-Jimenez et al., 2008). Liao et al., (2003) asserted the positive relationship between ACAP and SMEs' responsiveness. Hodgkinson et al., (2012) examined the indirect effect of ACAP on MO in public leisure services and concluded that ACAP has clear and different moderation effects consistent with management contexts.

Sun and Anderson (2010) argued that ACAP is deemed as a specific type of organizational learning (OL) associated with firm's relationship with external knowledge. Along these lines, Slater and Narver (1995) indicated that OL involves acquisition of new knowledge or foresights with the possibility of influencing behavior. As such, a wide stream of studies has made implicit reference to ACAP dimensions when the relationship between MO and learning process and their combined effect

on firm's innovation were examined (Baker & Sinkula, 2005, 2007; Grinstein, 2008a; Hurley & Hult, 1998; Jiménez-Jimenez et al., 2008). Hence, MO can play a mediating role in the relationship between entrepreneurial orientation (EO) and technological innovation capabilities, on the one hand, and in the relationship between absorptive capacity **(**ACAP) and technological innovation on the other hand. According to the above discussions, the following hypotheses are posited:

H6a: Market orientation mediates the relationship between entrepreneurial orientation and technological innovation capabilities.

H6b: Market orientation mediates the relationship between absorptive capacity and technological innovation capabilities.

2.12 Chapter Summary

Previous researches on innovation have emphasized the role of firm's resources that foster technological innovation capabilities (TIC); these resources are related to a firm's abilities to deal with knowledge about market and customers' current and future demands. This research examines entrepreneurial orientation (EO), absorptive capacity **(**ACAP), and market orientation (MO) as antecedents that influence TIC level in industrial SMEs in the Kurdistan region of Iraq. The RBV Theory is chosen as the underpinning theory for this research. The reason for the adoption of this theory is based on previous studies that used it when studying TIC. Based on the review of the relevant literature, the theoretical framework is developed to reflect the factors that may influence TIC. Consequently, six research hypotheses are formulated and justified to validate and support the proposed model.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

In view of research questions and objectives presented in the first chapter and in the light of discussion of related literature in the previous chapter, this chapter provides information about the research design, the research approach, sampling and questionnaire design, variables and measurements, in addition to data collection and statistical methods used in this study.

3.2 Research Design

The research design refers to the set of decisions and comprehensive mapping strategy that are chosen to coordinate and integrate the different constituent parts of the research in a symmetric and logical way, hence providing the basis for effectively addressing the research tools; techniques for collecting data and evidences and the appropriate statistical techniques for data analysis (Babbie, 2011; Singh, 2006). Thus, research design is the work that precedes the actual implementation of the research.

The aim of a research design is to ensure that the obtained data and evidence can help effectively in identification and solving of the research problem as unequivocally as possible to provide appropriate answers to the developed research questions (Sekaran & Bougie, 2009).

Moreover, research design fundamentally depends on the philosophical assumptions that underlie the research (Creswell, 2009). Therefore, the nature of the research topic has a pivotal role in selecting the adequate research design.

However, researchers have adopted different types of research design consistent with their research requirements and there is an urgent necessity to clarify the ideological differences between them to realize their requirements and conditions. Zikmund, Babin, Carr, and Griffin, (2010) divided research design into three types, namely: exploratory, descriptive and causal research designs. Similarly, Saunders, Lewis, and Thornhill, (2009) classified research design into exploratory, descriptive and explanatory research designs.

Moreover, Sekaran and Bougie (2009) confirmed three types of research design depending on the stage to which knowledge about research topic has advanced: exploratory, descriptive and hypothesis testing design stages. The focal point of exploratory study is collecting as much information as possible to understand new bases of research. This type of research design does not seem to be the intended design to the current research. In addition, descriptive study is undertaken to verify and describe specific characteristics of the researched variables (Sekaran & Bougie, 2009). The objective of descriptive study, therefore, is to depict a precise profile of individuals, incidents, phenomena or situations (Zikmund et al., 2010). Hence, this research design is not the type that

the current research is looking to adopt as it is inappropriate for the research aims.

Researchers who employ hypothesis testing usually attempt to explain the nature of specific relations or to interpret the variance in the dependent variables; which occurs as a result of other variables' effect (Sekaran & Bougie, 2009). Thus, it is used to test the direction and strength of the relationships between different variables, to emend or support the original theory (Cohen et al., 2007; Kothari, 2004). But a curious side of hypothesis testing is that researchers consider evidence that supports a hypothesis as different from the evidence that has already been proven (Neuman, 2007).

According to Kothari (2004), hypotheses testing design is based on inferential analysis in order to establish with what validity the data can denote some conclusions about the relationships between variables. Consequently, the researcher acknowledges the suitability of this type of design for the present research.

3.3 Research Approach

Social scientists have classified research approaches into two broad categories: quantitative and qualitative researches. The former one is based on the measurement of quantities. Thus, it is suitable for phenomena that can be explicated in terms of numbers. On the other hand, qualitative research deals with qualitative phenomena, involving

quality, in sort or kind, and is usually used in historical or philosophical researches (Kothari, 2004; Marczyk, DeMatteo, & Festinger, 2005; Singh, 2006).

However, the research requirements and the nature of the data handled by the researcher determine the selection of either an inductive or a deductive approach to provide answers to practical problems (Babbie, 2011; Cohen et al., 2007).

Researchers usually adopt inductive approach when they are concerned with the context in which qualitative phenomena occur and they try to evolve a new theory from data analysis. On the other hand, deductive approach is used when researchers intend to prove the validity of an existing theory with empirical evidences by analyzing quantitative data (Saunders et al., 2009).

Scholars, like Babbie (2011); Neuman, (2007); and Sekaran & Bougie (2009) mentioned that researchers who use the deductive approach, have comprehension about the world mechanisms and they want to test that empirically. They usually begin with extracted ideas, and then deal with the logical relationship among concepts to reach specific empirical evidence. On the contrary, researchers who follow an inductive approach start from extensive observations of the phenomenon to reach the more abstract ideas to build their theories from the ground-up.

In consonance with research requirements and questions, the researcher perceives that the quantitative research is the most adequate approach to the present research, due to its potential to measure the facts in the form of numbers. Further, this approach can enable the researcher to generalize the empirical findings obtained by examining a specific sample on the population as a whole (Hair, Black, Babin, & Anderson, 2010).

3.4 Population

As is normal in research fields, researchers deal with aggregate form of elements, which can be a person, a group, an organization, an event or even a social action. All elements of interest to the researcher represent the population of the study (Marczyk et al., 2005; Nueman, 2007; Sekaran & Bougie, 2009). Typically, researchers investigate a subgroup of the population, and that subgroup is called a sample (discussed later) due to the difficulties that they may face in investigating the whole population of interest. Therefore, it is essential that the sample be representative of its population and that could be done by answering a critical question, namely, who is to be sampled? This could be answered through an accurate determination of the target population (Cochran, 1977; Marczyk et al., 2005; Zikmund et al., 2010).

A target population must be accurately defined in order to include the right elements within the sample frame from which the final subjects

will be chosen (Babbie, 2011). To achieve this desired level of accuracy; the sample frame should meet specific standards (Cooper & Schindler, 2014; Zikmund et al., 2010) as follows:

-Include a list of all elements that encompasses the population

-Include details that offer the potential to stratify the sample

-Be updated and complete

- Be recurrence-free.

The list of industrial SMEs working in the Kurdistan region in 2013 are adopted for sampling purposes for this research as it includes up-to-date information, helps to determine the working area, the number of employees, the nature of industrial activity and the amount of capital per enterprise. The population in this study is all industrial SMEs that operate in the three provinces of the Kurdistan region, namely: Erbil, Sulaimany and Duhok.

The total number of industrial SMEs is 2,607 for the year 2013 according to Ministry of Industrial and Trading of Kurdistan region government (MTIKRG). These enterprises are different in terms of production and cover a wide variety of industrial activities (machinery and equipment, construction materials, food industry, electric industry, non-metal industry, metal industry, textiles industry and paper industry) as illustrated in Table 3.1. The target population for this research takes into consideration all these eight categories to ensure the best levels of representation for the research population

Table 3.1
Industrial Activities for the Target Population (13/6/2013)

Industrial Activities / Provinces	machinery and equipment	construction materials	food industry	electric industry	Non- metal industry	metal industry	textiles industry	paper industry	Total
Erbil	32	647	240	18	407	381	39	14	**1778**
Sulaimany	10	223	168	2	78	50	0	3	**534**
Duhok	2	109	75	4	74	22	5	4	**295**
Total	**44**	**979**	**483**	**24**	**559**	**453**	**44**	**21**	**2607**

Source: MTIKRG, 2013

3.5 Sampling Design

As defined, sampling is the procedure of selecting a small section from the total targeted population to give a reliable estimation of the whole (Cochran, 1977; Zikmund et al., 2010). Theorists of social sciences (Sekaran & Bougie, 2009; Singh, 2006) have indicated that a sample would make it possible to draw conclusions about the population as a whole. In the strict sense, it is possible to generalize these conclusions to the entire population.

Social sciences studies have confirmed two types of sampling methods: non-probability sampling and probability sampling (Babbie, 2011; Nueman, 2007; Sekaran & Bougie, 2009; Zikmund et al., 2010)

Non-probability sampling method is usually applied in qualitative studies and when the population elements do not have any chance to be selected as sample subjects. By contrast, researchers tend to use probability sampling in quantitative studies when the elements in a given population

possess the same chance of being chosen as a subject within the selected sample (Sekaran & Bougie, 2009).

According to Nueman (2007), most debates on sampling come from researchers who use the quantitative approach. Saunders et al., (2009) asserted that probability sampling is most often associated with survey research strategy where the researchers have to make deductions from the selected sample about the entire population to answer research questions or to meet its objectives.

It could be argued that sample representation of a population is the most important method of probability sampling, where narrowly defining the population of interest and all population elements have an equal and independent chance to be selected as the sample subjects (Babbie, 2007; Marczyk et al., 2005; Sekaran & Bougie, 2009; Singh, 2006). To obtain more information on a certain sample size, researchers tend to use one of the most efficient research sampling designs, namely, stratified random sampling. Initially, researchers split the population into subpopulations or strata depending on the common characteristics among the given population elements. After that, a random sample is drawn from each subpopulation by using simple random or systematic sampling techniques (Kothari, 2004; Nueman, 2007; Saunders et al., 2009). Nevertheless, researchers try to control the relative size of each individual stratum rather than allow the random process to control it. Therefore, two reasons make this sampling design more competent than the simple random sampling

design: (i) better representation of each stratum; and (ii) more distinctive information can be gained about each stratum (Babbie, 2011; Sekaran & Bougie, 2009).

As mentioned above, the targeted population of this study comprises eight groups of industrial SMEs. Therefore, stratified sampling is adopted as the sampling procedure in this study because it is more accurate and less biased, as well as having the possibility of generalizing the results.

Determining the appropriate size of the sample is essential for the successful completion of the research (Cochran, 1977). As mentioned in Table 3.1, the 2607 industrial SMEs make up the population of this study. Based on Krejcie and Morgan (1970), it is adequate to select a minimum sample of 338 industrial SMEs from the whole research population. The number for each industrial sector was decided by relying on its percentage of the whole population. After multiplying this number with the sample size, the required sample was selected randomly from each industrial sector (Kothari, 2004). Thus, in order to obtain the representative strata from each industrial activity, the total number for each individual industry has been divided on the total number of all industries (2067), then multiply with 338 (the required sample size). After that, simple random sampling has been conducted by picking out the names of the enterprise from each industry using Microsoft excel formula to generate random numbers as shown in Table 3.2.

Accordingly, this number also meets the statistical analysis requirements in Partial Least Squares Structural Equation modelling (PLS-SEM). Hair, Hult, Ringle, & Sarstedt (2014) suggested that each parameter estimation requires 5-20 observations. In other words, distributed questionnaires must be at least five times more than the number of questions. Hence, for the purpose of the current study, the estimated sample size vis-à-vis the number of questions in the questionnaire is:

67 (number of questions) × 5 = 335 questionnaires

Table 3.2
Sample distribution to each industrial activity based on its percentage from the entire target population

Industrial Activities	machinery and equipment	construction materials	food industry	electric industry	Non- metal industry	metal industry	textiles industry	paper industry	**Total**
Allocated Sample	6	126	63	3	72	59	6	3	**338**
Percentage	2%	37%	19%	1%	21%	17%	2%	1%	**100%**

3.6 Unit of Analysis

According to Babbie (2011), a unit of analysis is what or who represents the main entity that is being studied and analyzed in a given research. Accurate thinking about specific situations often leads to revealing that a problem can be studied and analyzed at more than one level of analysis (Zikmund et al., 2010). Neuman (2007) pointed out that each research technique is more homogeneous with specific units of analysis. For example, survey and experimental research usually consider the individual

as their unit of analysis. Therefore, it is necessary to determine the unit on which the researched variables will be measured, whether it is events, organizations, strategic business units, groups or individuals (Sekaran & Bougie, 2009).

Within the Kurdistan region of Iraq, industrial SMEs are selected as the unit of analysis of the present study for many reasons. First, given the wide range of privatization of large governmental enterprises in the Kurdistan region to overcome the problem of low level performance and innovate new products (as mentioned in research problem), thus, the private industrial sector represents the focus of the Kurdish industry that faces aggressive foreign competition. Second, the industrial sector is the most affected one among others, like banking, agriculture and tourism, given to the enormous importing process. Third, the vital role of SMEs in supporting economic development in the region.

SMEs in the Kurdistan region are defined according to the World Bank as published in the International Finance Corporation (IFC) report, where enterprises with 1-19 employees are considered as small enterprises; enterprises with 20-99 employees are considered as medium enterprises; and the large enterprises are those that hire 100 employees and above (IFC, 2011).

Kurdistan region government (KRG) shows specific concern for the establishment of integrated industrial areas in the three governorates of the

Kurdistan region, by offering the fundamental infrastructure and facilities to ensure the basic work requirements for these enterprises can attract local and regional industries. The existence of industrial zones in specific places facilitated the process of finding the respondents and collecting the required data from the field. Although the government has assigned about 5,050,000 square meters for industrial zones, the actual occupied area is about 45.46% of the total area (RDSKR, 2011).

3.7 Questionnaire Design

This section describes the items used to measure the researched variables. The questionnaire is divided into five sections: firstly, a cover letter demonstrating the title and the aim of the study in addition to general information about the organization. Then a separate section has assigned to each investigated variable, the endogenous (dependent) variable is technological innovation capabilities (TIC). The exogenous (independent) variables are entrepreneurial orientation (EO) and absorptive capacity (ACAP). The mediator variable is market orientation (MO). Table 3.3 provides the details:

Table 3.3
List of research variables

Variables	Dimensions	Number of questions
Dependent Variable		
Technological Innovation Capabilities	Product Innovation Capabilities	5
	Process Innovation Capabilities	11
Independent Variables		
Entrepreneurial Orientation	Proactiveness	6
	Risk-taking	4
	Innovativeness	10
Absorptive Capacity	Acquisition	4
	Assimilation	4
	Transformation	4
	Exploitation	4
Mediator Variable		
Market Orientation	Intelligence Generation	5
	Intelligence Dissemination	5
	Responsiveness	5
Total		**67**

3.8 Structure of Questionnaire

Section 1: General Information.

This section gathers information related to firm profiles in terms of age and gender of the owners, type of industrial activity, number of years the firm has been operating in the Kurdistan region, the size of the firms in terms of employees and their ownership. This section aims to comprehend the general profile of the firms.

Section 2: Dependent Variable – Technological Innovation Capabilities.

This section obtains understanding of the TIC level as part of competitive advantage. Prior to this section a question is asked in order to eliminate respondents who do not have a clue about TIC.

There are 16 items to measure TIC, which investigate both product and process dimensions of the TIC construct. The measurement scale is depended on The Organization for Economic Co-operation and Development's (2005) definition to measure TIC dimensions, namely, product innovation capabilities, which refer to any novel product to satisfy customers' needs; and process innovation capabilities which involve firm's wide efforts to create or improve a manufacturing method and bring about new developments in the process or system. The measurement scale is adopted from (Camisón & Villar-López, 2012b; Menguc & Auh, 2010; Tuominen & Hyvönen, 2004). Camisón & Villar-López (2012b) used the instrument and found the composite reliability to be above 0.81 for this instrument. Questions are accompanied by a seven-point response, ranging from '7' for "Strongly agree" to '1' for "Strongly disagree". Table 3.4 below shows the 16 items used to measure the TIC dimensions.

Table 3.4
Technological Innovation Capabilities Measures

Dimensions & sources	Codes	Items Description
Product Innovation Capabilities: (Camisón & Villar-López, 2012b); (Menguc & Auh, 010); (Tuominen & Hyvönen, 2004)	**ProdInn1**	Our enterprise is able to replace obsolete products.
	ProdInn2	Our enterprise is able to extend the range of products.
	ProdInn3	Our enterprise is able to develop environmentally friendly products.
	ProdInn4	Our enterprise is able to improve product design.
	ProdInn5	Our enterprise is able to reduce the time to develop a new product until it is launched in the market.
Process Innovation Capabilities: (Camisón & Villar-López, 2012b); (Tuominen & Hyvönen, 2004)	**ProcInn1**	Our enterprise is able to manage a portfolio of interrelated technologies.
	ProcInn2	Our enterprise is able to master and absorb the basic technologies of business.
	ProcInn3	Our enterprise continually develops programs to reduce production costs.
	ProcInn4	Our enterprise has valuable knowledge for manufacturing and technological processes.
	ProcInn5	Our enterprise has valuable knowledge on the best processes and systems for work organization.
	ProcInn6	Our enterprise assigns resources to the production department efficiently.
	ProcInn7	Our enterprise delivers its products efficiently.
	ProcInn8	Our enterprise is able to maintain a low level of stock without impairing manufacturing processes.
	ProcInn9	Our enterprise is able to offer environmentally friendly processes.
	ProcInn10	Our enterprise manages production organization efficiently.
	ProcInn11	Our enterprise is able to integrate production management activities.

Section 3: Independent Variable – Entrepreneurial Orientation.

This section includes 20 items that probe the three main dimensions of entrepreneurial orientation: (i) proactiveness which refers to the level of firm's anticipation and response to the future needs of market and customers; (ii) risk-taking which refers to the extent to which firm owners/managers are interested in employing a big proportion of firm resources and to afford huge debts in their seeking behind the opportunity; and (iii) the innovativeness that refers to firm's capability and tendency to participate in and encourage new ideas which may lead to producing new products or applying new processes. The objective of this section is to determine the level to which the surveyed firms have entrepreneurial orientation (EO).

Drawing on Miller and Friesen (1982), the EO instrument was built. Measuring process depends on a seven-point Likert scale ranging from '7' for "Strongly agree" to '1' for "Strongly disagree". For better clarity and avoiding respondents' confusion, the questions are purposely categorized into a grid. Boso et al., (2012a) found that composite reliability ranged from 0.92 to 0.71; Avlonitis & Salavou (2007) found that the Cronbach's Alpha was 0.78 which indicates that the measure is reliable. Table 3.5 presents the items to measure entrepreneurial orientation.

Table 3.5
Entrepreneurial Orientation Measures

Dimensions & sources	Codes	Items Description
Proactiveness : (Avlonitis & Salavou, 2007); (Boso et al., 2012a); (Miller & Friesen, 1982)	**Proac1**	Our enterprise produces more new products in comparison with main competitors.
	Proac2	We usually make changes to develop our products as compared to our main competitors.
	Proac3	Our enterprise emphasizes strongly on the development of new products.
	Proac4	We initiate actions to which competitors then respond.
	Proac5	Our enterprise is always the first business to introduce new products
	Proac6	Our enterprise adopts a very competitive posture.
Risk-taking: (Avlonitis & Salavou, 2007); (Boso et al., 2012a); (Miller & Friesen, 1982)	**Risk1**	Our enterprise has a strong inclination for high risky venture with the chances of very high returns.
	Risk2	Owing to the nature of the environment, risk taking acts are necessary to achieve the enterprise's objectives.
	Risk3	We adopt an aggressive position in order to maximize the probability of exploiting potential opportunities.
	Risk4	Our enterprise shows a great deal of tolerance for high risk projects.
Innovativeness: (Avlonitis & Salavou, 2007); (Boso et al., 2012a); (Miller & Friesen, 1982)	**Innovati1**	Our product requires a major learning effort by customers.
	Innovati2	Our products took a long time before customers could understand its full advantages.
	Innovati3	The product concept was difficult for customers to understand.
	Innovati4	Our products were tried in the market.
	Innovati5	Our products offer more possibilities to customers.
	Innovati6	Our product offers unique, innovative features to customers.
	Innovati7	Our product covers more customer needs.
	Innovati8	Our product has more uses.
	Innovati9	Our product is of higher quality in comparison to main competitors.
	Innovati10	Our product is superior in technology.

Section 4: Independent Variable – Absorptive Capacity.

The dimensions of absorptive capacity measured through 16 items as follows: (i) acquisition that refers to firm's capability to recognize, diagnose and obtain specific knowledge that is externally generated and considered significant to its activities; (ii) assimilation which denotes the firm's capability to process, analyze, explain and comprehend the information, knowledge and skills acquired from external sources; (iii) transformation, which basically refers to firm's capability to integrate the newly acquired knowledge with the existing knowledge through a bundle of procedures, technologies, and resources that facilitate utilization of integrated knowledge; and (iv) exploitation, which essentially indicates firm's capability to implement the transformed knowledge into its products and processes to maintain continuous growth. The questions are adapted from previous literature (Flatten, Engelen, et al., 2011) to be structurally short and more accurate, question sequencing in this section is done in a logical manner, beginning from knowledge acquisition to exploitation of knowledge. Flatten, Greve, et al., (2011) found that Cronbach's Alpha for this measurement ranged from 0.90 to 0.70, which showed enough reliability for this instrument. Questions were accompanied by a seven-point response scale from '7' for "Strongly agree" to '1' for "Strongly disagree". Table 3.6 presents the items used to measure absorptive capacity (ACAP) dimensions.

Table 3.6
Absorptive Capacity Measures

Dimensions & sources	Codes	Items Description
Acquisition: (Flatten, Engelen, et al., 2011); (Flatten, Greve, et al., 2011)	**Acqu1**	In our enterprise, we search constantly for relevant information concerning our industry.
	Acqu2	Our enterprise motivates the employees to use information sources within our industry.
	Acqu3	Our enterprise expects that the employees deal with information beyond our industry.
	Acqu4	Our interaction with our suppliers is characterized by mutual trust.
Assimilation: (Flatten, Engelen, et al., 2011); (Flatten, Greve, et al., 2011)	**Assi1**	In our enterprise ideas are communicated among employees.
	Assi2	Our enterprise emphasizes employees' cooperation to solve problems.
	Assi3	In our enterprise there is a quick information flow, e.g., if an employee obtains important information, he communicates this information promptly to all other employees.
	Assi4	Our enterprise demands periodical meetings among employees to interchange new developments, problems and achievements.
Transformation: (Flatten, Engelen, et al., 2011); (Flatten, Greve, et al., 2011)	**Trans1**	Our employees have the ability to use collected knowledge.
	Trans2	Our employees are used to absorb new knowledge.
	Trans3	Our employees successfully link existing knowledge with new insights.
	Trans4	Our employees are able to apply new knowledge in their practical work.
Exploitation: (Flatten, Engelen, et al., 2011); (Flatten, Greve, et al., 2011)	**Expl1**	Our enterprise supports the development of prototypes.
	Expl2	Our enterprise regularly reconsiders technologies to adapt them according to new knowledge.
	Expl3	Our enterprise has the ability to work more effectively by adopting new technologies.
	Expl4	Our enterprise has the capabilities needed to exploit the knowledge obtained from the outside.

Section 5: Mediator Variable – Market Orientation.

The measure of market orientation (MO) is adopted from Kohli and Jaworski (1993). The scale has three dimensions: (i) intelligence generation which is the process of gathering the required information related to customers wishes; (ii) Intelligence dissemination, which pertains to knowledge sharing among different sections and members of the firm; and (iii) responsiveness which refers to formulation and implementation of all the required actions toward generating and disseminating intelligence to meet customers' needs.

This variable is measured using a total of 15 items; the subscales comprise five items for all disseminations. Questions are accompanied by a five-point response scale ranged from '5' for "Strongly agree" to '1' for "Strongly disagree". Boso et al., (2012a) showed a highly reliability exceeding 0.81; while Jiménez-Jimenez et al., (2008) found that composite reliability ranged from 0.84 to 0.79 .Table 3.7 shows the items to measure MO.

The reason for selecting 5 point Likert scale is to avoid response set or response style problem, which happens when some people try to response a large number of items in the same way and they agreeing in usual, because of laziness or a psychological predisposition (Neuman, 2007). In addition, scholars (Ishak, 2012; Perdomo-Ortiz et al., 2009) have utilized this approach to avoid common method variance before data analysis as suggested by Podsakoff, MacKenzie, and Lee (2003).

Table 3.7
Market Orientation Measures

Dimensions & sources	Codes	Items Description
Intelligence generation: (Boso et al., 2012a)**;** (Jiménez-Jimenez et al., 2008)**;** (Kohli & Jaworski, 1993)	**Gene1**	We generate a lot of information concerning trends (e.g., regulations, technological developments, political, economical) in our market.
	Gene2	We constantly monitor our level of commitment in serving customer needs.
	Gene3	The likely effects of changes in the business environment on the enterprise are frequently reviewed
	Gene4	We periodically analyze the effect of the shift in the business environment over the enterprise
	Gene5	Our enterprise adapts quickly to the shift in the business environment
Intelligence dissemination: (Boso et al., 2012a)**;** (Jiménez-Jimenez et al., 2008)**;** (Kohli & Jaworski, 1993)	**Disse1**	When something important happens to a major customer, the whole enterprise is informed about it within a short period.
	Disse2	Data on customer satisfaction are disseminated at all levels in our enterprise on a regular basis.
	Disse3	We always consider the information that can influence the way we serve our customers.
	Disse4	We always hold meetings at least once in every quarter to discuss market trends and developments
	Disse5	If we find out something about competitors, we quickly inform other employees.
Responsiveness: (Boso et al., 2012a)**;** (Jiménez-Jimenez et al., 2008)**;** (Kohli & Jaworski, 1993)	**Respon1**	Our enterprise responds quickly to its competitors' price changes.
	Respon2	Our enterprise reacts quickly to the changes in its customers' product needs.
	Respon3	If a major competitor was to launch an intensive campaign targeted at our customers, we would implement a response immediately.
	Respon4	Our enterprise constantly reviews its product development efforts to ensure that they are in line with what customers want.
	Respon5	Our enterprise is fast in adapting to the changes in the business context.

3.9 Questionnaire translation

The model of Brislin of back-translation is considered the most popular translation method among cross-cultural researchers. This model is widely used to support instrument validation and to ensure the equivalence in meanings and interpretations between the original and translated measures (Cha, Kim, & Erlen, 2007; Regmi, Jennie, & Paul, 2010).

The importance of equivalence was conceptualized by Regmi et al., (2010) in two different parts: content equivalence, which indicates the extent to which the text construct includes similar and homogeneous meanings in two different languages or cultures; and semantic equivalence, where the meanings are symmetric in two different languages or cultures after the translation process.

Based on this method, the questionnaire was translated into the Kurdish language, and then sent to two bilingual experts (English / Kurdish) to ensure that the texts of these two versions are consistent. Then, another bilingual expert translated it back from the final Kurdish version to English language to eliminate the differences (See Appendices A1 and A2).

3.10 Pilot study

In order to ensure the questionnaire's intelligibility and avoid any lapses, the questionnaire should undergo a pilot test, by using data gathered from the same targeted population of the study to verify the validity and reliability of the instrument (Bryman & Bell, 2011).

To ensure this, five academicians in innovation and marketing from Malaysia and Iraq were asked to evaluate the content or face validity of the instrument. Based on their recommendations, the questionnaire was revised in terms of sentence structure, questions number and choice and arrangement of phrases. After taking into consideration the comments received from the experts, the questionnaire was sent to linguistic experts to ensure the equivalence in both content and semantics and to assure a high response rate.

For pilot study purposes, the size of the group commonly ranges from 25-100 subjects (Cooper & Schindler, 2014). In this study, 81 questionnaires were distributed to the owners of industrial SMEs in the Kurdistan region of Iraq. Then, the validity and reliability of the instrument were tested based on the collected data. The following paragraphs discus in more detail the pilot test.

3.10.1 Instrument Validity

The term, 'validity' refers to the ability of the measurement to measure what it is purported to measure (Cooper & Schindler, 2014). Research methodology literature, especially in the social science domain, has mentioned many types of validity measures. However, the most commonly used types are content and construct validity (Cooper & Schindler, 2014; Sekaran & Bougie, 2009).

Generally, content validity refers to the extent to which the measure adequately measures what it is supposed to measure. Therefore, content validity basically depends on the judgmental estimation of experts to assure that all aspects of the respective construct are covered in the measurement. Hence, this study is based on academicians' recommendations in building its instrument as mentioned before, in addition to the extensive review of related literature. Further, some of the potential respondents were interviewed to evaluate the clarity and ease of understanding the phrases in the questionnaire.

On the other hand, construct validity is performed by using factor analysis. For this purpose, varimax rotation and principle component methods are applied. In addition, Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity are checked to measure the sampling adequacy and applicability of factor analysis. As Kaiser suggested, KMO values are considered large and meritorious if it is equal or more than 0.80, medium

if it is around 0.70 and acceptable if it is around 0.60, whereas it is unacceptable if it is around 0.50 (Fleming, 1985).

The pilot study outcomes as illustrated in Table 3.8 show that KMO values range from 0.753 and 0.879 and reflect the appropriateness of factor analysis for this study (See Appendix B). All items with loadings around 0.50 and less are considered as meaningless items and should be excluded from their constructs in statistical analysis (Hair, Ringle, & Sarstedt, 2011). In this study, some items were deleted from their constructs after collecting the final data given their inability to achieve this condition as illustrated in chapter four.

3.10.2 Instrument reliability

A measure is considered reliable if it provides consistent results. Thus, the reliability is considered as a certification of the consistency and stability of the instrument (Cooper & Schindler, 2014; Sekaran & Bougie, 2009). The most common method used in testing reliability is Cronbach's Alpha method, which is applied by the current study to test the reliability of instruments for each investigated construct separately. Cronbach's Alpha coefficient can be considered as excellent if it is more than 0.90, good if it is around 0.8, acceptable if it is around 0.7, and questionable if it is around 0.6, but poor and unacceptable if it is less than 0.60 (Zikmund et al., 2010).

Table 3.8 illustrates acceptable levels of Cronbach's Alpha coefficients for all investigated constructs which underpins the internal consistency of the scale. It can also be observed that there is no item for exclusion which enhances the internal consistency of the scale.

Table 3.8
Factor Analysis and Reliability of the Final Instrument (Pilot Study)

Constructs	Dimensions	No. of Items	Factor loading for items *	KMO	Eigen-value	% of Variance	Cronbach 's Alpha	Items Deleted
Technological Innovation Capabilities	**Product Innovation Capabilities**	5	.900 .893 .683 .815 .686	0.879	3.346	20.915	.865	Nil
	Proccess Innovation Capabilities	11	.720 .965 .934 .972 .681 .951 .858 .815 .732 .693 .662		7.552	47.200	.952	Nil
Entreprenurial Orientation	**Proactivness**	6	.780 .823 .779 .798 .836 .872		3.831	19.154	.904	Nil
	Risk-Taking	4	.798 .804 .836 .746	0.838	1.824	9.119	.873	Nil
	Innovativeness	10	.738 .768 .703 .639 .811 .839 .819 .760 .758 .789		7.909	39.546	.933	Nil
Absorptive Capacity	**Knowledge Acquisition**	4	.862 .870 .861 .818		3.144	19.653	.881	Nil
	Knowledge Assimilation	4	.745 .654 .774 .752		1.934	12.086	.723	Nil
	Knowledge Transformation	4	.777 . 836 .723 .830	0.757	2.294	14.340	.809	Nil
	Knowledge Exploitation	4	.901 .844 .900 .822		3.554	22.215	.893	Nil
Market Orientation	**Intelligence Generation**	5	.705 .839 .788 .761 .710		1.918	12.787	.821	Nil
	Intelligence Dissimination	5	.748 .752 . 772 .751 .757	0.753	2.959	19.723	.854	Nil
	Intelligence Responsivness	5	.930 .869 .708 .807 .932		5.402	36.014	.923	Nil

*Item are as ordered in the questionnaire set

3. 11 Data Collection Procedures

To collect data, a field study based survey was performed in the industrial SMEs in the Kurdistan region to examine the research hypotheses and to clarify the nature of the relationship between the researched variables.

Several scholars (Babbie, 2011; Cooper & Schindler, 2014; Zikmund et al., 2010) have affirmed that survey is an efficacious, inexpensive and precise way to estimate information about a specific population. Nueman (2007) pointed out the appropriateness of the survey method for research objectives that deal with personal beliefs or behaviors. Creswell, (2009) asserted that surveys are preferable methods for measuring awareness, opinions, attitude and trends. Moreover, it is used for research that aims to test hypotheses or formulate and examine the relationship between variables (Kothari, 2004).

Many of the academic researches that have examined the innovation topic have studied the enterprises' adoption of innovation by involving the attitude of their owners and their opinions (Ar & Baki, 2011; Avlonitis & Salavou, 2007; Kamal & Flanagan, 2012; Wang & Han, 2011). Hence, in order to gain the desired information from the appropriate sample, questionnaires were distributed to SME owners in the current research.

In addition, response rate for previous studies related to SMEs' innovation ranged from 21-67% (Ar & Baki, 2011; Avlonitis & Salavou, 2007; Liao et al., 2010; Morris et al., 2007; Zahra, 2008). Therefore, the sample in the

current study was doubled to get the appropriate sample size in the light of the targeted population and statistical analysis requirements.

After the questionnaire was piloted, data was collected from the three provinces, namely: Erbil, Sulaimany and Duhok. The survey was conducted from early May 2014 to the end of August 2014. The data was collected from the industrial SMEs owners within these three provinces during the same period of time, while, the data collected from every industry one after the other. The questionnaire was administrated in Kurdish language after the back-to-back translation method to ensure the equivalence in meanings and interpretations between the original and translated questionnaire (See Appendices E and D).

Finally, the total number of collected and usable questionnaires was 432. However, the study faced a number of problems and hindrances which coincided with the data collection process, i.e., the high cost of distributing the questionnaires, especially the transportation costs, therefore the researcher got support from some assistants. The security situation exposed Iraq and the Kurdistan region was reflected in the fear of people and poor interaction with strangers which made it harder to distribute the questionnaires.

3.12 Data Analysis Techniques

In order to analyze the data and test the hypotheses, various statistical tools were employed, and tested with SPSS 19 and the Smart PLS-SEM 3.0 software.

3.12.1 Descriptive Analysis

Descriptive quantitative analysis was carried out, comprising analysis of mean, and standard deviation, by relying on SPSS software. This package was utilized also in the pilot study to verify the validity and reliability of the instrument.

3.12.2 Hypotheses Testing

The hypotheses were tested by using PLS-SEM. It is a statistical test applied to measure the relationship between one endogenous/dependent variable and one or more than one exogenous/independent variable/s. To predict the extent to which independent variables can explain the dependent variable. While sample size has a direct impact on statistical power of multiple regression, it has been proposed that the minimum ratio should be 5:1; in other words, there must be five observations for every question (Hair, Sarstedt, Ringle, & Mena, 2011).

In general, SEM applies a two-step model: measurement model and structural model, in one statistical test (Anderson & Gerbing, 1991; Hair, Ringle, et al., 2011). Within the measurement model, the researchers conduct a validation of the measurement model by employing

confirmatory factor analysis (CFA). The researchers also test the construct validity by testing the following: construct's uni-dimensionality, reliability, convergent validity, discriminate validity and predictive validity. Once the measurement model is validated, the second step is to estimate the structural relationship between latent variables; in other words, the estimation of the model fit is conducted.

Prior literature on the PLS method has emphasized its beneficial characteristics (Hair, Ringle, et al., 2011; Sarstedt, Ringle, Smith, Reams, & Hair, 2014; Wetzels, Schröder, & Oppen, 2009). The widespread use of PLS path modeling among practitioners and scientists stemmed from four of its characteristics: (i) as opposed to singularly emphasizing on the general reflective mode, it enables the unlimited computation of cause-and-effect relationship models using both reflective and formative measurement (Astrachan, Patel, & Wanzenried, 2014; Hair et al., 2014) giving greater power to the PLS in the estimation of the parameters; (ii) PLS is appropriately utilized in the estimation of path models in small-sized samples (Hair, Ringle, et al., 2011); (iii) PLS path models have the capability of transforming into complex models because of their various latent and manifest variables without the hassle of issues of estimation (Hair, Ringle, et al., 2011; Sarstedt et al., 2014). In addition, the PLS path modeling is considered as methodologically beneficial compared to Covariance-Based Structural Equation Model (CBSEM) in circumstances of non-normal data distributions (Astrachan et al., 2014; Hair et al., 2010).

Moreover, the number of latent and manifest variables may be significantly linked to observation numbers in case of complex models; and (iv) PLS path modeling is appropriate even in highly skewed distributions (Hair, Sarstedt, et al., 2011) or when the distribution of observations is not determined (Fornell & Larcker, 1981; Hair, Ringle, et al., 2011; Hair et al., 2010).

3.13 Chapter Summary

This chapter discusses the research methodology and design, provides a demonstration of population, sampling and pilot study that deals with validity and reliability issues by collecting 81 observations from industrial SMEs owners working in the Kurdistan region. Further, data collection procedures and statistical techniques are discussed in this chapter.

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

4.1 Introduction

The results of data analysis procedures are presented in this chapter in the following sequence. First, it examines the distribution of respondents according to their demographic profile; then it describes the variables through descriptive statistics; followed by the construct and discriminant validity establishment. Next, the structural model's quality is examined, and the procedures for hypotheses testing are reported. Lastly, this chapter provides a justification of the goodness of the outer model related to the study's constructs.

4.2. Demographic Distribution of the Respondents

In this research, 676 questionnaires were distributed over the eight industrial activities representing all industrial SMEs operating in the Kurdistan region of Iraq, of which 646 questionnaires were returned. The questionnaire contains a filter question that differentiates between enterprises having previous products or process innovation – respondents must tick "YES"; and those that do not tick "NO" as presented in Table 4.1.

Table 4.1
Respondents According to Filter Question

Respondents' Categories	Frequencies	Percentage (%)
Yes	464	72%
No	182	28%
Total	646	100%

The survey was conducted for four months beginning from early May 2014 to the end of August 2014. Some questionnaires had missing data and were treated as such. The missing data issue has been extensively discussed in literature by Hair et al., (2010). The procedure for handling missing data is shown in Table 4.2.

Table 4.2
Procedure for Missing Data Status

Missing Data Status	**Procedures**
≤10%	Ignored
<15%	Nominee for deletion
20% to 30%	Can be often remedied
≥ 50%	Should be deleted

Source: Hair *et al*. (2010)

As mentioned, the final data comprises 432 questionnaires with response rate of 63.9%, as shown in Table 4.3, and is appropriate for analysis:

Table 4.3
Returned questionnaires

Categories	**Frequencies**	**Percentage (%)**
Complete questionnaires	432	93%
Incomplete questionnaires	32	7%
Total	464	100%

The final sample consisted of SME owners operating in the Kurdistan region of Iraq. The profile of the sample appropriately represents the examined population. The respondents were distributed according to their demographic characteristics, like age, gender, type of industrial activity, duration of operating in the Kurdistan region, number of employees, education level and enterprise ownership.

The respondents' demographic details are presented in Table 4.4. The respondents' ages are divided into five categories: (i) age equal to or less than 25 years that constituted three (0.69%) respondents; (ii) 26-35 years which constituted 25 (5.78%) respondents; (iii) 36-45 years which constituted 65 (15.04%) respondents; (iv) 46-55 years which constituted the largest number of 294 (68.05%) respondents; and (v) 56 years and above which constituted 45 (10.41%) respondents. These results indicate that the representative sample of age of respondents ranges from 25 years and younger to 56 years and above.

With regards to gender, the male respondents are more than the females. Out of 432 respondents, 421 (97.45%) are male and 11 respondents (2.54%) are female. This result reflects the masculine nature of most of the eastern communities, including the Kurdistan region of Iraq. This gender gap may be attributed to some social and cultural factors. In most areas of the Kurdistan region of Iraq, women do not enjoy the same social status and opportunities for education as their male counterparts do. In addition, customs and traditions, for example, shame culture, and early marriage, have a significant impact on limiting these opportunities. Moreover, poverty is another limiting factor which prompts parents to prefer educating their sons at the expense of their daughters. This results in women losing the opportunity to compete with men, especially in the labor market.

The present study's sample represents the industrial SMEs in the Kurdistan region of Iraq, according to industrial activity as follows: 250 enterprises

are from the construction sector representing 57.87% of the total sample; the electric industry comprises just two enterprises making up 0.46%; the food industry is represented by 58 enterprises or 13.42% of the total sample; machinery and equipment comprises four enterprises (0.92%); metal industry constitutes 45 enterprises (10.41%); non-metal industry is represented by 63 enterprises (14.58%); while paper and textiles industry comprise four (0.92%) and six enterprises (1.38%), respectively.

With regards to the duration the enterprises have been operating in the Kurdistan region, the majority of the enterprises (228) have been operating for 10-20 years (52.77%); followed by 6-9 years with 150 enterprises (34.72%); less than five years comprising 46 enterprises (10.64 %); and more than 20 years represented by eight enterprises (1.85%). These results show that the sample in the present study constitutes enterprises that possess considerable experience to enable them to make new innovations.

The size of the enterprises was gauged through the number of employees in each enterprise. Accordingly, the enterprises were divided into three groups. The majority of the enterprises constituting 298 (68.98%) have less than or equal to nine employees; while 102 enterprises (32.61%) have between 10 to 19 employees; followed by enterprises with 20-99 employees constituting 32 enterprises (7.40%). Also, the results show that all the enterprises of the respondents are owned by local owners 432 enterprises (100%).

Lastly, with regards to the education level, 15 respondents (3.47%) do not have any certificate; while 13 respondents (3%) have primary school certificates. In addition, 62 respondents (14.35%) have tertiary school certificates. Those with graduate degrees constituted 79 respondents (18.28%). Secondary school certificate holders formed the majority of the sample with 263 respondents (60.87%). This results may be attributed to the security situation of the 1980s that prevented many men from continuing their education.

Table 4.4
Respondents' Demographic Information

Demographic Variable	Category	Frequency (n=432)	Percentage %
Age	≤ 25	3	0.69%
	26-35	25	5.78%
	36-45	65	15.04%
	46-55	294	68.05%
	56 ≤	45	10.41%
Gender	Female	11	2.54%
	Male	421	97.45%
Type of industrial activity	Construction materials	250	57.87%
	Electric industry	2	0.46%
	Food industry	58	13.42%
	Machinery and equipment	4	0.92%
	Metal industry	45	10.41%
	Non- metal industry	63	14.58%
	Paper industry	4	0.92%
	Textiles industry	6	1.38%
Duration of operating in the Kurdistan Region	≤ 5	46	10.64%
	6-9	150	34.72%
	10-20	228	52.77%
	20<	8	1.85%
Number of employees in enterprise	≤ 9	298	68.98%
	10-19	102	23.61%
	20-99	32	7.40%
Enterprise ownership	Kurdish owned	432	100%
	Non - Kurdish owned	0	0.00%
Educational attainment	No certificates	15	3.47%
	Primary school Certificate	13	3.00%
	Secondary school certificate	263	60.87%
	Tertiary school certificate	62	14.35%
	Graduate Degrees	79	18.28

4.3 Testing Non-Response Bias

This study used the survey questionnaire that was distributed to specific locations in order to gather data. It is important to conduct a non-response bias for the collected data for two reasons: (i) some respondents only completed the questionnaire after several reminders; and (ii) the data was collected during four months from May 2014 to August 2014. The assessment of non-response bias was conducted by t-test technique where the responses of the early respondents were compared to that of the late respondents.

This procedure is in line with Armstrong and Overton (1977). They explained that if the answers' differences of the two groups of respondents are significant, this may indicate considerable difference between them. Accordingly, the t-test was carried out on the 387 early respondents and 45 late respondents as they only completed the survey following repetitive reminders. Table 4.5 and Table 4.6 display the t-test result where no significant differences are noted between the two groups (See Appendix C).

Table 4.5 shows small differences of the mean score between the two groups (early and late respondents) for each dimension. Therefore, it can be inferred that the respondents from these two groups are free from data bias, as supported by Levene's test for equality of variance in Table 4.6

Table 4.5
Group Statistics of Independent Sample t-test (n=432)

Constructs	Early/Late responses	n	Mean	Std. Deviation	Std. Error
Technological Innovation Capabilities	Early Responses	387	4.246	1.132	0.0575
	Late Responses	45	4.136	1.326	0.1977
Entrepreneurial Orientation	Early Responses	387	4.035	0.824	0.0419
	Late Responses	45	3.921	0.554	0.0826
Absorptive Capacity	Early Responses	387	4.374	0.736	0.037
	Late Responses	45	4.263	0.506	0.075
Market Orientation	Early Responses	387	3.125	0.653	0.033
	Late Responses	45	3.251	0.449	0.067

The result in Table 4.6 suggests that there are small significant differences between early and late responses across all the dimensions (p-value at the 0.001 significance level). Hence, it can be concluded that the samples obtained are able to represent the total population of the study (Armstrong & Overton, 1977).

Table 4.6
Independent Sample t-test Results for Non-Response Bias (n=432)

Constructs	Leven's Test of Equality of Variances		Test of Equality of the Means		
	F Value	Significance	T Value	DF	Significance
Technological Innovation Capabilities	3.682	0.056	0.604	430	0.546
Entrepreneurial Orientation	5.955	0.015	0.909	430	0.364
Absorptive Capacity	6.088	0.014	0.980	430	0.327
Market Orientation	8.729	0.003	-1.269	430	0.205

4.4 Descriptive Statistics

In order to obtain the data summary, the researcher made use of descriptive statistics to provide a general overview of the study's variables, namely: technological innovation capabilities (TIC), entrepreneurial orientation (EO), absorptive capacity (ACAP), and market orientation (MO) from the perspectives of the respondents. Accordingly, the mean, maximum and minimum and the standard deviation of the constructs were determined to reflect their level as shown in Table 4.7.

All the constructs' means are above the average; the mean of Technological Innovation Capabilities is 4.235, with standard deviation of 1.152. For entrepreneurial orientation, the mean is 4.023 with standard deviation of 0.801. Absorptive capacity obtained a mean of 4.362 with standard deviation of 0.716; and for market orientation, the mean is 3.138 with standard deviation of 0.635.

Table 4.7
Descriptive Statistics of the Constructs

Variables	Mean	Std. Deviation	Minimum	Maximum
Technological Innovation Capabilities	4.235	1.152	1	7
Entrepreneurial Orientation	4.023	0.801	1	7
Absorptive Capacity	4.362	0.716	1	7
Market Orientation	3.138	0.635	1	5

4.5 Testing the Goodness of the Measurements

Smart-PLS 3.2.0 was utilized for the confirmation of the construct validity of the researched variables. The outcomes are discussed in the next sections.

4.5.1 Testing the Measurement Model "Outer Model" using PLS approach

Before the hypotheses were tested, the measurement model or "outer model" was evaluated with the help of PLS-SEM. Actually, this study employed the two-stage method, utilized by prominent researchers in the area of PLS-SEM, like Wetzels et al., (2009) and Hair *et al*. (2014). The model and its structural dimensions are presented in Figure 4.1.

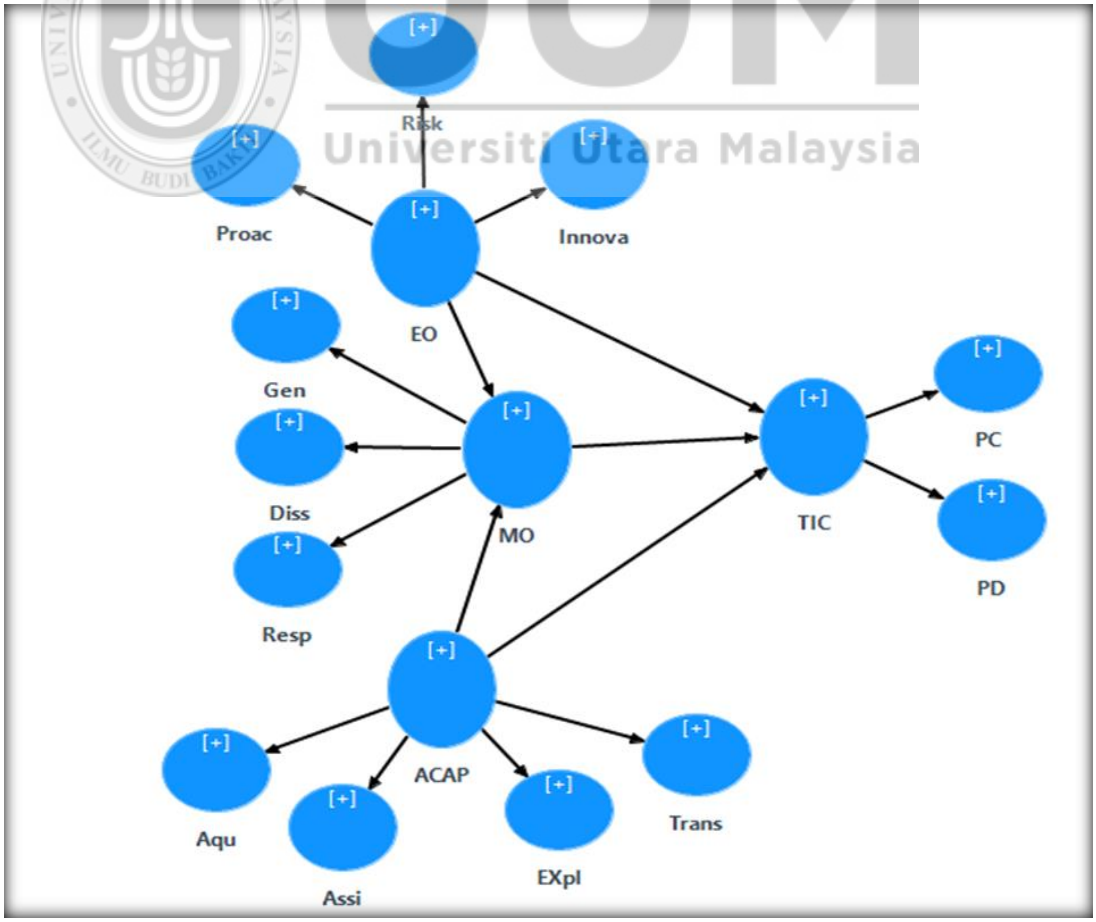

Figure 4.1 *Research Model*

4.5.1.1 The Construct Validity

Three types of validity testing must be carried out to obtain construct validity, namely: content validity, convergent validity and discriminant validity (Hair, Ringle, et al., 2011).

4.5.1.1.1 Content Validity

According to studies on psychometrics, content validity denotes that all the involved questions in measuring a determined construct should possess high loadings on their respective constructs to represent all facets of that construct (Hair, Ringle, et al., 2011). In other words, the items produced to measure a construct must reflect higher loading on their construct in comparison to other constructs. This is ensured through a comprehensive literature review to obtain items that have already been tested for their validity by prior studies.

In this study, the construct items and their outcomes based on factor analysis are displayed in Table 4.8 This Table lists the content validity of items and their measures in two ways. First, the items display high loading on their distinct constructs compared to other constructs; and second, the loadings of items loaded on their constructs significantly indicate their content validity (Hair et al., 2014).

In Table 4.8 and Figure 4.2, the technological innovation capabilities (TIC) construct has two dimensions, namely: Product Innovation Capabilities (ProdInn); and Process Innovation Capabilities (ProcInn);

Entrepreneurial Orientation (EO) has three dimensions: proactiveness (Proac), risk-taking (Risk) and innovativeness (Innovati); Absorptive Capacity (ACAP) includes four dimensions: knowledge acquisition (Acqu), knowledge assimilation (Assi), knowledge transformation (Trans) and knowledge exploitation (Expl); and Market Orientation is demonstrated by three dimensions: Intelligence Generation (Gen), Intelligence Dissemination (Disse) and Intelligence Responsiveness (Respon).

Table 4.8

The Cross Loadings Factors for Exogenous and Endogenous variables.

Items	Aqu	Assi	Diss	EXpl	Gen	Innova	Proac	ProcInn	ProdInn	Resp	Risk	Trans
Acqu1	**0.753**	-0.012	0.039	0.110	0.095	0.041	0.052	0.072	0.066	0.156	0.044	0.152
Acqu2	**0.759**	0.070	0.045	0.165	0.025	-0.065	0.042	0.062	-0.057	0.073	0.046	0.080
Acqu3	**0.729**	0.063	0.069	0.130	0.045	0.042	0.033	0.033	0.033	0.093	0.035	0.038
Acqu4	**0.734**	-0.005	0.100	0.126	0.070	-0.014	0.012	0.105	0.030	0.107	0.007	0.104
Assi1	0.001	**0.732**	0.002	0.091	-0.033	-0.017	0.016	0.042	0.090	-0.078	-0.055	0.033
Assi2	0.024	**0.776**	-0.045	0.054	-0.014	0.020	0.026	0.063	0.035	-0.009	-0.049	0.070
Assi3	0.032	**0.734**	-0.004	0.057	0.013	0.020	0.062	0.100	0.088	0.019	0.012	0.029
Assi4	0.061	**0.723**	0.027	-0.029	-0.084	-0.012	-0.022	0.120	0.055	-0.040	0.034	0.087
Disse1	0.071	-0.049	**0.719**	0.091	0.048	0.054	0.084	0.187	0.177	0.011	-0.007	0.043
Disse2	0.042	-0.005	**0.789**	0.145	0.114	0.028	0.030	0.214	0.132	-0.022	-0.023	-0.008
Disse3	0.031	0.040	**0.777**	0.108	0.057	0.056	0.085	0.202	0.123	0.041	-0.007	0.044
Disse4	0.129	0.011	**0.762**	0.114	0.101	0.066	0.049	0.181	0.169	0.099	0.029	0.125
Disse5	0.033	-0.038	**0.674**	0.108	0.123	-0.002	0.012	0.099	0.087	-0.013	0.032	0.104
Expl1	0.134	0.067	0.173	**0.795**	0.096	0.054	0.114	0.149	0.036	0.064	0.035	0.145
Expl2	0.139	0.037	0.151	**0.787**	0.140	0.057	0.113	0.113	-0.073	0.060	-0.049	0.097
Expl3	0.173	0.042	0.112	**0.773**	0.139	0.039	0.025	0.110	0.045	0.072	0.021	0.125
Expl4	0.116	0.041	0.041	**0.779**	0.082	0.093	0.039	0.111	0.019	0.137	-0.009	0.155
Gene1	0.079	-0.025	0.093	0.132	**0.812**	0.163	0.105	0.053	0.083	0.043	0.142	0.134
Gene2	0.017	0.013	0.028	0.096	**0.756**	0.069	0.022	0.042	0.071	0.015	0.128	0.062
Gene3	0.082	-0.055	0.105	0.173	**0.807**	0.126	0.076	0.119	0.008	0.076	0.123	0.098
Gene4	0.052	-0.056	0.102	0.126	**0.854**	0.125	0.047	0.055	0.040	0.065	0.082	0.066
Gene5	0.079	-0.021	0.141	0.050	**0.756**	0.103	0.057	0.052	0.067	0.095	0.112	0.119
Innovati1	0.025	0.013	0.009	0.047	0.051	**0.758**	0.045	0.104	0.131	0.111	0.014	-0.001
Innovati2	-0.023	0.066	0.024	0.046	0.059	**0.715**	-0.002	0.097	0.151	0.074	0.074	0.067
Innovati3	-0.002	0.029	0.019	0.057	0.155	**0.752**	0.059	0.137	0.109	0.139	0.072	0.049
Innovati4	-0.035	-0.014	-0.010	0.054	0.107	**0.688**	0.091	0.115	0.092	0.051	-0.001	0.051
Innovati5	0.018	0.020	0.104	0.069	0.174	**0.823**	0.083	0.171	0.143	0.114	0.095	0.029
Innovati6	0.028	-0.017	0.016	0.005	0.042	**0.741**	0.058	0.157	0.076	0.054	0.139	-0.008
Innovati7	-0.007	-0.065	0.029	0.031	0.037	**0.723**	0.038	0.140	0.086	0.073	0.146	0.053
Innovati9	-0.005	0.063	0.069	0.074	0.158	**0.736**	0.062	0.186	0.129	0.084	0.093	0.031
Innovati10	-0.008	-0.068	0.094	0.135	0.197	**0.707**	0.063	0.103	0.042	0.039	0.112	0.093

Continuing of Table 4.8

The Cross Loadings Factors for Exogenous and Endogenous variables.

Items	Aqu	Assi	Diss	EXpl	Gen	Innova	Proac	ProcInn	ProdInn	Resp	Risk	Trans
Proac1	0.002	0.064	0.016	0.063	0.004	0.040	**0.742**	0.054	0.022	-0.042	0.066	-0.020
Proac2	0.055	-0.057	0.122	0.087	0.105	0.054	**0.750**	0.103	0.007	0.101	0.120	0.011
Proac3	0.048	0.067	0.084	0.044	0.072	0.091	**0.819**	0.129	-0.023	0.050	0.122	-0.031
Proac4	0.069	-0.005	-0.049	0.044	0.057	0.043	**0.652**	0.063	0.003	0.007	-0.012	0.018
Proac5	0.023	0.021	0.025	0.095	0.049	-0.003	**0.659**	0.096	-0.009	0.028	0.040	0.005
Proac6	0.004	0.025	0.059	0.080	0.040	0.073	**0.684**	0.080	-0.035	0.021	-0.002	-0.031
ProcInn1	0.079	0.143	0.184	0.126	0.060	0.183	0.073	**0.806**	0.212	0.135	-0.003	0.086
ProcInn2	0.107	0.071	0.197	0.102	0.048	0.182	0.116	**0.856**	0.186	0.100	-0.052	0.011
ProcInn4	0.031	0.091	0.205	0.078	0.022	0.078	0.087	**0.853**	0.174	0.114	-0.056	0.025
ProcInn6	0.080	0.094	0.201	0.150	0.043	0.167	0.128	**0.922**	0.172	0.113	-0.045	0.047
ProcInn7	-0.007	0.097	0.169	0.091	0.089	0.141	0.096	**0.668**	0.196	0.105	-0.031	-0.011
ProcInn9	0.107	0.100	0.203	0.151	0.063	0.122	0.139	**0.892**	0.126	0.103	-0.004	0.049
ProcInn10	0.094	0.061	0.205	0.173	0.119	0.142	0.071	**0.713**	0.202	0.100	0.031	0.087
ProcInn11	0.093	0.044	0.178	0.131	0.099	0.173	0.088	**0.734**	0.379	0.107	-0.005	0.085
ProdInn1	0.019	0.084	0.187	0.026	0.026	0.115	0.015	0.191	**0.815**	0.067	0.023	0.112
ProdInn2	-0.015	0.056	0.155	0.011	0.051	0.106	-0.026	0.201	**0.885**	0.068	0.039	0.066
ProdInn3	-0.009	0.049	0.082	0.001	0.029	0.115	-0.031	0.180	**0.693**	0.074	0.008	0.082
ProdInn4	0.042	0.013	0.174	0.005	0.098	0.175	0.025	0.223	**0.814**	0.055	0.031	0.101
ProdInn5	0.055	0.164	0.112	-0.008	0.051	0.045	-0.022	0.187	**0.672**	0.055	-0.066	0.156
Respon1	0.094	-0.078	-0.001	0.027	0.063	0.093	-0.005	0.070	0.056	**0.702**	0.000	-0.011
Respon2	0.093	0.013	-0.031	0.090	0.024	0.060	0.043	0.137	0.020	**0.734**	0.034	0.006
Respon3	0.090	-0.034	-0.002	0.039	0.048	0.068	0.039	0.078	0.122	**0.714**	0.094	0.142
Respon4	0.138	-0.028	0.088	0.136	0.058	0.072	0.020	0.094	0.070	**0.815**	-0.010	0.082
Respon5	0.114	-0.005	0.045	0.087	0.080	0.121	0.060	0.126	0.036	**0.751**	0.006	0.071
Risk1	0.037	0.083	0.015	-0.010	0.084	0.064	0.074	-0.016	0.042	-0.006	**0.738**	0.005
Risk2	0.066	-0.013	0.022	0.007	0.111	0.093	0.092	-0.061	-0.032	0.003	**0.876**	0.030
Risk3	0.060	-0.056	-0.033	0.021	0.140	0.080	0.085	-0.023	-0.013	0.067	**0.877**	0.070
Risk4	-0.008	-0.066	0.017	-0.018	0.151	0.137	0.047	0.009	0.047	0.031	**0.871**	0.027
Trans1	0.121	0.039	0.122	0.170	0.124	0.047	-0.063	0.006	0.096	0.077	0.051	**0.792**
Trans2	0.059	0.091	0.043	0.096	0.116	0.056	0.034	0.019	0.116	0.071	0.025	**0.765**
Trans3	0.075	0.067	0.034	0.042	0.087	0.058	0.006	0.130	0.047	0.019	0.021	**0.739**
Trans4	0.126	0.036	0.048	0.182	0.046	0.010	-0.011	0.040	0.133	0.074	0.024	**0.768**

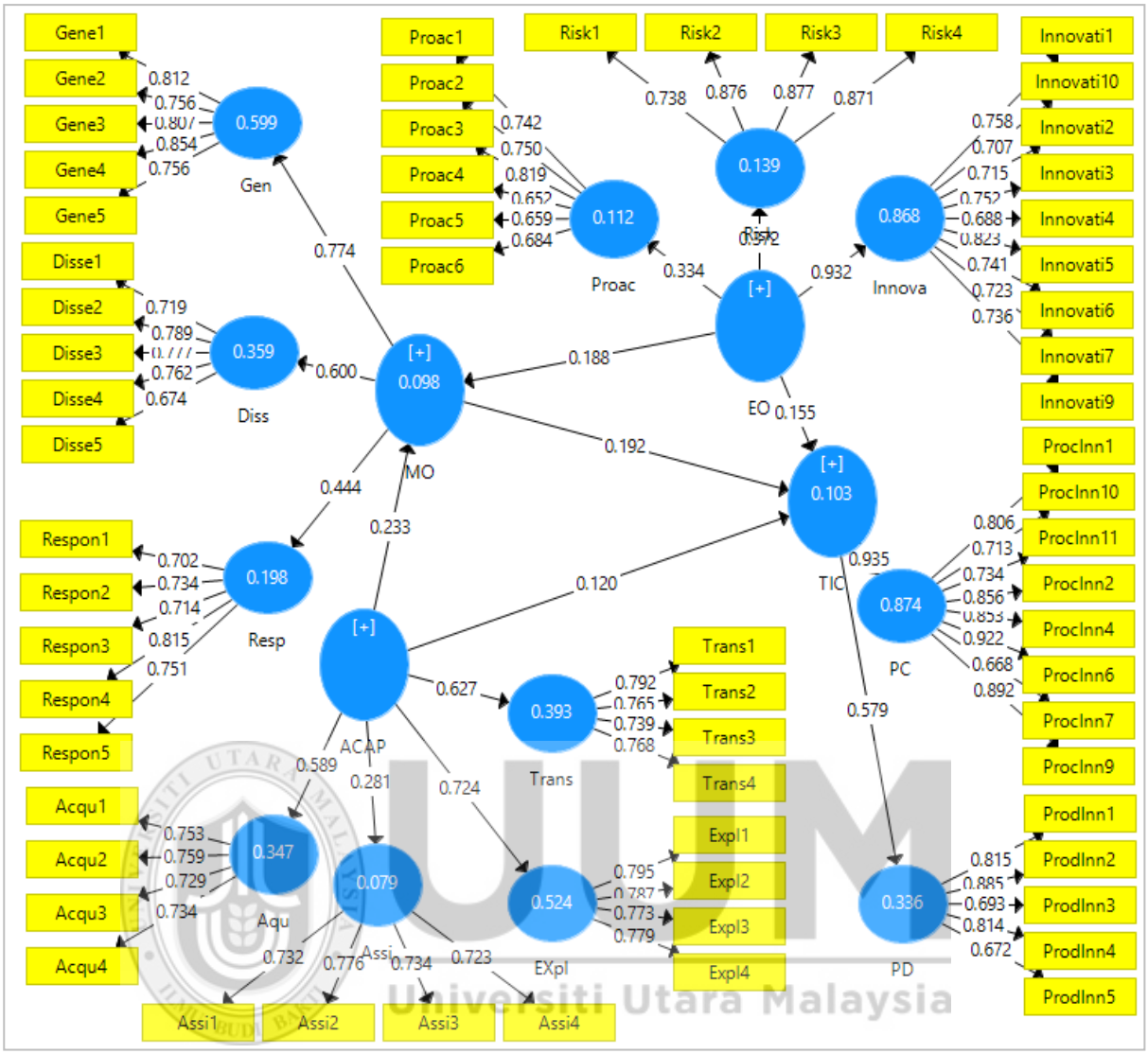

Figure 4. 2 Path Algorithm Results

As shown in Table 4.8, some items have low factor loadings, namely Innovativeness (Innovati8) and Process Innovation Capabilities (ProcInn3, ProcInn5, ProcInn8); while factor loadings of all other constructs have values greater than 0.65. Therefore, these items were deleted from statistical analysis to meet PLS-SEM requirements.

4.5.1.1.2 Convergent Validity of the Measures

This pertains to the level to which a measure of specific indicators positively measures the same determined construct (Hair, Ringle, et al., 2011). Convergent validity entails the testing of several criteria: factor loadings, composite reliability (CR) and average variance extracted (AVE) as indicated by Hair et al. (2011). Accordingly, the items' loadings were assessed and revealed that the all items' loadings are higher than 0.60, which are considered acceptable loading levels as explained in the literature on multivariate analysis. The factor loadings of the items are listed in Table 4.9 and are all significant at the level of 0.05.

Table 4.9
Significance of factor loadings

Constructs	Items	Loading	Standard Error (STERR)	t- Statistics (|O/STERR|)	P- value
Technological innovation capabilities (TIC)	**ProdInn1**	0.815	0.021	38.911	0.000
	ProdInn2	0.885	0.012	73.820	0.000
	ProdInn3	0.693	0.040	17.296	0.000
	ProdInn4	0.814	0.021	39.393	0.000
	ProdInn5	0.672	0.036	18.587	0.000
	ProcInn1	0.806	0.028	28.899	0.000
	ProcInn2	0.856	0.018	48.525	0.000
	ProcInn4	0.853	0.021	40.524	0.000
	ProcInn6	0.923	0.011	85.901	0.000
	ProcInn7	0.668	0.032	20.971	0.000
	ProcInn9	0.892	0.016	57.419	0.000
	ProcInn10	0.713	0.034	20.753	0.000
	ProcInn11	0.734	0.027	27.543	0.000
Entrepreneurial orientation (EO)	**Proac1**	0.742	0.198	3.737	0.000
	Proac2	0.750	0.189	3.961	0.000
	Proac3	0.819	0.201	4.065	0.000
	Proac4	0.652	0.183	3.573	0.000
	Proac5	0.659	0.198	3.330	0.001
	Proac6	0.684	0.179	3.815	0.000
	Risk1	0.738	0.089	8.260	0.000
	Risk2	0.876	0.086	10.217	0.000
	Risk3	0.877	0.091	9.599	0.000
	Risk4	0.871	0.081	10.784	0.000
	Innovati1	0.758	0.023	33.249	0.000
	Innovati2	0.715	0.027	26.957	0.000
	Innovati3	0.752	0.026	29.038	0.000
	Innovati4	0.688	0.030	22.943	0.000
	Innovati5	0.823	0.018	46.574	0.000
	Innovati6	0.741	0.026	28.531	0.000
	Innovati7	0.723	0.029	25.053	0.000
	Innovati9	0.736	0.029	25.555	0.000
	Innovati10	0.707	0.030	23.498	0.000

Continuation of Table 4.9
Significance of factor loadings

Constructs	Items	Loading	Standard Error (STERR)	t- Statistics (|O/STERR|)	P- value
Absorptive capacity (ACAP)	**Acqu1**	0.753	0.028	26.469	0.000
	Acqu2	0.759	0.031	24.878	0.000
	Acqu3	0.729	0.035	21.073	0.000
	Acqu4	0.734	0.035	20.762	0.000
	Assi1	0.732	0.288	2.538	0.011
	Assi2	0.776	0.298	2.602	0.009
	Assi3	0.734	0.307	2.393	0.017
	Assi4	0.723	0.309	2.344	0.019
	Trans1	0.792	0.025	31.953	0.000
	Trans2	0.765	0.030	25.915	0.000
	Trans3	0.739	0.034	21.758	0.000
	Trans4	0.768	0.029	26.327	0.000
	Expl1	0.795	0.024	33.764	0.000
	Expl2	0.787	0.024	32.839	0.000
	Expl3	0.773	0.026	29.248	0.000
	Expl4	0.779	0.024	32.243	0.000
Market orientation (MO)	**Gene1**	0.812	0.020	39.692	0.000
	Gene2	0.756	0.026	28.727	0.000
	Gene3	0.807	0.020	40.640	0.000
	Gene4	0.854	0.014	62.414	0.000
	Gene5	0.756	0.024	31.449	0.000
	Disse1	0.719	0.081	8.883	0.000
	Disse2	0.789	0.084	9.422	0.000
	Disse3	0.777	0.081	9.548	0.000
	Disse4	0.762	0.080	9.549	0.000
	Disse5	0.674	0.077	8.804	0.000
	Respon1	0.702	0.184	3.811	0.000
	Respon2	0.734	0.198	3.712	0.000
	Respon3	0.714	0.187	3.824	0.000
	Respon4	0.815	0.201	4.046	0.000
	Respon5	0.751	0.186	4.028	0.000

Another convergent validity aspect is CR which refers to the level to which a set of items show the latent construct consistently (Hair et al., 2011). The CR of items was assessed and their values are presented in Table 4.10. It is evident from the Table that the CR of items ranges from 0.830 to 0.938, all greater than the 0.70 recommended value (Fornell & Larcker, 1981; Hair, Ringle, et al., 2011). The outer model's convergent validity was further validated through AVE, which represents the average of the variance extracted from the set of items in relation to the variance shared with the measurement errors. AVE values of at least 0.50 indicate

that the set of items is characterized by sufficient convergence in construct measurement (Hair et al., 2014; Hair, Ringle, et al., 2011). In this study, the AVE values range from 0.518 to 0.710, showing an appropriate measurement level of construct validity.

Table 4.10
Convergent Validity Analysis

Constructs	Items	Factor Loadings	Convergent Validity		
			Cronbach's Alpha	[a] Composite Reliability	[b] Average Variance Extracted
Technological Innovation Capabilities	**ProdInn1**	0.815	0.835	0.885	0.609
	ProdInn2	0.885			
	ProdInn3	0.693			
	ProdInn4	0.814			
	ProdInn5	0.672			
	ProcInn1	0.806	0.923	0.938	0.656
	ProcInn2	0.856			
	ProcInn4	0.853			
	ProcInn6	0.923			
	ProcInn7	0.668			
	ProcInn9	0.892			
	ProcInn10	0.713			
	ProcInn11	0.734			
Entrepreneurial Orientation	**Proac1**	0.742	0.815	0.865	0.518
	Proac2	0.750			
	Proac3	0.819			
	Proac4	0.652			
	Proac5	0.659			
	Proac6	0.684			
	Risk1	0.738	0.862	0.907	0.710
	Risk2	0.876			
	Risk3	0.877			
	Risk4	0.871			
	Innovati1	0.758	0.896	0.915	0.546
	Innovati2	0.715			
	Innovati3	0.752			
	Innovati4	0.688			
	Innovati5	0.823			
	Innovati6	0.741			
	Innovati7	0.723			
	Innovati9	0.736			
	Innovati10	0.707			

a: CR = (Σ factor loading)2 / {(Σ factor loading)2) + Σ (variance of error)}
b: AVE = Σ (factor loading)2 / (Σ (factor loading)2 + Σ (variance of error)}

Continuation of Table 4.10

Convergent Validity Analysis

Constructs	Items	Factor Loadings	Convergent Validity		
			Cronbach's Alpha	[a] Composite Reliability	[b] Average Variance Extracted
Absorptive Capacity	**Acqu1**	0.753	0.731	0.832	0.553
	Acqu2	0.759			
	Acqu3	0.729			
	Acqu4	0.734			
	Assi1	0.732	0.727	0.830	0.550
	Assi2	0.776			
	Assi3	0.734			
	Assi4	0.723			
	Trans1	0.792	0.766	0.850	0.587
	Trans2	0.765			
	Trans3	0.739			
	Trans4	0.768			
	Expl1	0.795	0.790	0.864	0.614
	Expl2	0.787			
	Expl3	0.773			
	Expl4	0.779			
Market Orientation	**Gene1**	0.812	0.857	0.897	0.636
	Gene2	0.756			
	Gene3	0.807			
	Gene4	0.854			
	Gene5	0.756			
	Disse1	0.719	0.799	0.862	0.556
	Disse2	0.789			
	Disse3	0.777			
	Disse4	0.762			
	Disse5	0.674			
	Respon1	0.702	0.799	0.861	0.554
	Respon2	0.734			
	Respon3	0.714			
	Respon4	0.815			
	Respon5	0.751			

a: C.R = (Σ factor loading)2 / {(Σ factor loading)2) + Σ (variance of error)}

b: AVE = Σ (factor loading)2 / (Σ (factor loading)2 + Σ (variance of error)}

4.5.1.1.3 The Discriminant Validity of the Measures

The outer model's construct validity required the validation of discriminant validity. This is a compulsory stage prior to testing the hypotheses and is conducted with the help of path algorithm analysis. The discriminant validity measures show the level to which the items are differentiated among the constructs; it ensures that the items utilize different non-overlapping constructs. Therefore, despite the correlation among the constructs, they are evaluated through distinct concepts as stated by Hair et al., (2011), who reached the conclusion that if the measures' discriminant validity is confirmed, the shared variance between each construct and its measures have to be greater compared to the variance shared among the constructs.

In this study, the discriminant validity was confirmed with the help of the method proposed by Fornell and Larcker (1981). The square root of average variance extracted (AVE) of all constructs placed at the correlation matrix of diagonal elements are presented in Table 4.11, where discriminant validity of the outer model is confirmed by the greater value of the diagonal elements in comparison to the other elements on the rows and columns. As the construct validity confirmed, the hypotheses results are considered to be valid and reliable.

Table 4.11
Correlations and discriminant validity

Items	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1)Acquisition	**0.744**											
2)Assimilation	0.039	**0.742**										
3)Dissemination	0.084	-0.009	**0.745**									
4)Exploitation	0.179	0.060	0.153	**0.784**								
5)Generation	0.079	-0.038	0.120	0.146	**0.798**							
6)Innovativeness	0.000	0.004	0.055	0.078	0.148	**0.739**						
7)Process Innovation Capabilities	0.092	0.108	0.238	0.154	0.081	0.183	**0.810**					
8)Product Innovation Capabilities	0.023	0.090	0.185	0.010	0.067	0.145	0.252	**0.780**				
9)Proactiveness	0.047	0.029	0.069	0.093	0.078	0.075	0.124	-0.009	**0.720**			
10)Responsiveness	0.144	-0.036	0.033	0.106	0.075	0.112	0.135	0.082	0.042	**0.744**		
11)Risk-taking	0.045	-0.022	0.007	0.000	0.146	0.113	-0.027	0.012	0.087	0.029	**0.843**	
12)Transformation	0.127	0.074	0.083	0.167	0.121	0.054	0.059	0.130	-0.014	0.081	0.040	**0.766**

Despite the frequent use of the Fornell-Larcker method for more than three decades, it is still characterized by weak sensitivity in terms of discriminant validity evaluation which calls for an alternative approach to face such problems (Henseler, Ringle, & Sarstedt, 2015).

The major drawback of the Fornell-Larcker method is the lack of further theoretical explanations regardless of the strong correlation of specific items that should be achieved with its own construct and weak correlations with other constructs. Also, this method does not offer any empirical evidence that may cause an obvious false correlation through theoretically unconnected indicators and constructs. In addition, this approach provides a criterion value and not a statistical test (Henseler et al., 2015). Thus, heterotrait-monotrait (HTMT) ratio has been developed to estimate the correlation between constructs (Henseler et al., 2015). Practically, there are two steps involved when applying the HTMT ratio to evaluate discriminant validity:

Firstly, it is used as a criterion by comparing it with a predetermined threshold. If the HTMT value is higher than the predetermined threshold, one can deduce that there is paucity of discriminant validity for the compared latent variables. The exact predetermined threshold is a debatable matter, where some researchers have proposed a value of 0.85 (Clark & Watson, 1995; Henseler et al., 2015). It has also been suggested to be 0.90 (Henseler et al., 2015).

However, Table 4.12 shows that all obtained correlation values are less than the lowest predefined threshold of 0.85, reflecting an acceptable level of HTMT as a criterion to assess discriminant validity.

Table 4.12
Heterotrait-Monotrait (HTMT) Ratio criterion values

Items	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1)Acquisition												
2)Assimilation	0.084											
3)Dissemination	0.110	0.074										
4)Exploitation	0.235	0.103	0.191									
5)Generation	0.104	0.065	0.150	0.176								
6)Innovativeness	0.075	0.082	0.087	0.097	0.169							
7)Process Innovation Capabilities	0.117	0.137	0.277	0.182	0.097	0.201						
8)Product Innovation Capabilities	0.092	0.129	0.225	0.070	0.089	0.171	0.292					
9)Proactiveness	0.076	0.096	0.117	0.125	0.104	0.096	0.144	0.056				
10)Responsiveness	0.185	0.102	0.080	0.144	0.093	0.132	0.159	0.101	0.089			
11)Risk-taking	0.071	0.093	0.049	0.053	0.169	0.131	0.053	0.065	0.108	0.072		
12)Transformation	0.175	0.110	0.117	0.205	0.150	0.079	0.092	0.163	0.068	0.126	0.064	

Secondly, the HTMT ratio can be used as a statistical test to assess discriminant validity by testing the null hypothesis (H0: HTMT ≥ 1) versus the alternative hypothesis (H1: HTMT < 1). In other words, if the confidence interval of HTMT contains the value 'one', (i.e., H0 accepted), it denotes lack of discriminant validity. To the contrary, if the value 'one' falls outside the confidence interval of HTMT, this denotes that the two evaluated constructs are practically discrete (Henseler et al., 2015). Table 4.13 illustrates that all investigated variables have acceptable level of HTMT confidence interval, since all acquired values are less than one, which leads to accepting H_1 and rejecting H_0 as discussed above.

Table 4.13
Heterotrait-Monotrait (HTMT) statistical test

Items	Standard Error (STERR)	T Statistics (|O/STERR|)	P-Values
Assimilation -> Acquisition	0.030	2.815	0.005
Dissemination -> Acquisition	0.039	2.814	0.005
Dissemination -> Assimilation	0.026	2.814	0.005
Exploitation -> Acquisition	0.066	3.562	0.000
Exploitation -> Assimilation	0.036	2.874	0.004
Exploitation -> Dissemination	0.050	3.838	0.000
Generation -> Acquisition	0.040	2.617	0.009
Generation -> Assimilation	0.029	2.280	0.023
Generation -> Dissemination	0.044	3.396	0.001
Generation -> Exploitation	0.051	3.444	0.001
Innovativeness -> Acquisition	0.023	3.267	0.001
Innovativeness -> Assimilation	0.020	4.201	0.000
Innovativeness -> Dissemination	0.026	3.279	0.001
Innovativeness -> Exploitation	0.037	2.593	0.010
Innovativeness -> Generation	0.044	3.853	0.000
Process innovation capabilities -> Acquisition	0.040	2.940	0.003
Process innovation capabilities -> Assimilation	0.042	3.226	0.001
Process innovation capabilities -> Dissemination	0.052	5.300	0.000
Process innovation capabilities -> Exploitation	0.053	3.432	0.001
Process innovation capabilities -> Generation	0.037	2.647	0.008
Process innovation capabilities -> Innovativeness	0.053	3.767	0.000
Product innovation capabilities -> Acquisition	0.030	3.090	0.002

Product innovation capabilities -> Assimilation	0.040	3.247	0.001
Product innovation capabilities -> Dissemination	0.051	4.415	0.000
Product innovation capabilities -> Exploitation	0.023	2.983	0.003
Product innovation capabilities -> Generation	0.035	2.537	0.011
Product innovation capabilities -> Innovativeness	0.049	3.491	0.001
Product innovation capabilities -> Process innovation capabilities	0.060	4.873	0.000
Proactiveness -> Acquisition	0.031	2.487	0.013
Proactiveness -> Assimilation	0.025	3.903	0.000
Proactiveness -> Dissemination	0.029	3.979	0.000
Proactiveness -> Exploitation	0.037	3.400	0.001
Proactiveness -> Generation	0.036	2.892	0.004
Proactiveness -> Innovativeness	0.031	3.046	0.002
Proactiveness -> Process innovation capabilities	0.046	3.149	0.002
Proactiveness -> Product innovation capabilities	0.020	2.743	0.006
Responsiveness -> Acquisition	0.049	3.748	0.000
Responsiveness -> Assimilation	0.027	3.856	0.000
Responsiveness -> Dissemination	0.026	3.145	0.002
Responsiveness -> Exploitation	0.043	3.307	0.001
Responsiveness -> Generation	0.038	2.436	0.015
Responsiveness -> Innovativeness	0.039	3.414	0.001
Responsiveness -> Process innovation capabilities	0.051	3.135	0.002
Responsiveness -> Product innovation capabilities	0.038	2.670	0.008
Responsiveness -> Proactiveness	0.025	3.567	0.000
Risk-taking -> Acquisition	0.032	2.251	0.025
Risk-taking -> Assimilation	0.026	3.597	0.000
Risk-taking -> Dissemination	0.022	2.228	0.026
Risk-taking -> Exploitation	0.021	2.540	0.011
Risk-taking -> Generation	0.050	3.393	0.001
Risk-taking -> Innovativeness	0.035	3.719	0.000
Risk-taking -> Process innovation capabilities	0.023	2.311	0.021
Risk-taking -> Product innovation capabilities	0.023	2.797	0.005
Risk-taking -> Proactiveness	0.035	3.124	0.002
Risk-taking -> Responsiveness	0.025	2.894	0.004
Transformation -> Acquisition	0.050	3.508	0.000
Transformation -> Assimilation	0.042	2.643	0.008
Transformation -> Dissemination	0.042	2.800	0.005
Transformation -> Exploitation	0.056	3.678	0.000
Transformation -> Generation	0.049	3.033	0.003
Transformation -> Innovativeness	0.033	2.364	0.018
Transformation -> Process innovation capabilities	0.033	2.788	0.006
Transformation -> Product innovation capabilities	0.052	3.121	0.002
Transformation -> Proactiveness	0.021	3.212	0.001
Transformation -> Responsiveness	0.030	4.236	0.000
Transformation -> Risk-taking	0.029	2.156	0.032

4.5.1.1.4 Establishing second order constructs

This study made use of second-order latent constructs for all investigated variables. Hence, there was a necessity to verify whether the first order constructs were competent to be conceptually elucidated by their second-order constructs before testing the research model.

Therefore, they have to be represented well by their hypothesized first-order constructs where these first-order constructs have to be discriminant and convergent (Byrne, 2010).

For the Technological Innovation Capabilities (TIC) construct, the two first-order constructs, namely: Product Innovation Capabilities (ProdInn) and Process Innovation Capabilities (ProcInn), elucidated the TIC construct well since the R squared values are 0.336 and 0.874, as illustrated in Table 4.14. In addition, Table 4.14 illustrates that these constructs are confirmed to be distinct using the Fornell and Larcker (1981) and Hair et al., (2014) criteria. Thus, these constructs are conceptually explained the second-order construct or TIC.

Table 4.14
Establishment of Second-Order Constructs

Second Order Construct	First Order Construct	Path cofficient	Std. Error	T-value	P-Value	R square
Technological Innovation Capabilities	**Product Innovation Capabilities**	0.579***	0.061	9.560	0.000	0.336
	Process Innovation Capabilities	0.935***	0.010	98.349	0.000	0.874
Entrepreneurial Orientation	**Proactivness**	0.334**	0.108	3.097	0.002	0.112
	Risk-Taking	0.372***	0.097	3.825	0.000	0.139
	Innovativeness	0.932***	0.030	30.635	0.000	0.868
Absorptive Capacity	**Knowledge Acquisition**	0.589***	0.073	8.090	0.000	0.347
	Knowledge Assimilation	0.281*	0.128	2.201	0.028	0.079
	Knowledge Transformation	0.627***	0.074	8.495	0.000	0.393
	Knowledge Exploitation	0.724***	0.055	13.150	0.000	0.524
Market Orientation	**Intelligence Generation**	0.774***	0.062	12.399	0.000	0.599
	Intelligence Dissimination	0.600***	0.097	6.152	0.000	0.359
	Intelligence Responsivness	0.444**	0.136	3.272	0.001	0.198

*:p<0.05; **:p<0.01; ***:p<0.001

Similarly, the Entrepreneurial Orientation (EO) construct was hypothesized to be measured through the three first-order constructs, namely: Proactivness (Proac), Risk-Taking (Risk) and Innovativeness (Innovati). These constructs are

explained well by the Entrepreneurial Orientation (EO) construct as shown by the R squared values of 0.112, 0.139 and 0.868, respectively.

Absorptive Capacity (ACAP) construct is explained through Knowledge Acquisition (Acqu), Knowledge Assimilation (Assi), Knowledge Transformation (Trans) and Knowledge Exploitation (Expl). Table 4.12 illustrates that these constructs are explained well by the ACAP construct as the R squared values range from 0.079 to 0.524.

Finally, Market Orientation (MO) construct is explained through Intelligence Generation (Gen), Intelligence Dissimination (Disse) and Intelligence Responsivness (Respon). Table 4.12 illustrates that R squared values for these constructs are 0.599, 0.359 and 0.198, respectively.

Additionally, Table 4.14 confirms the outcomes of the discriminant analysis where these constructs are convergent and discriminant. Thus, the investigated second-order constructs are explained clearly in their hypothesized first-order constructs, and such results could establish the second order constructs.

4.5.2 The Assessment of the Structural "Inner" Model and Hypotheses Testing Procedures

After the goodness of the outer model has been established, it is possible to carry out hypothesis testing. The hypothesized model was tested using Smart PLS3.2.0. Then, the path coefficients were generated as displayed in Figure 4.3.

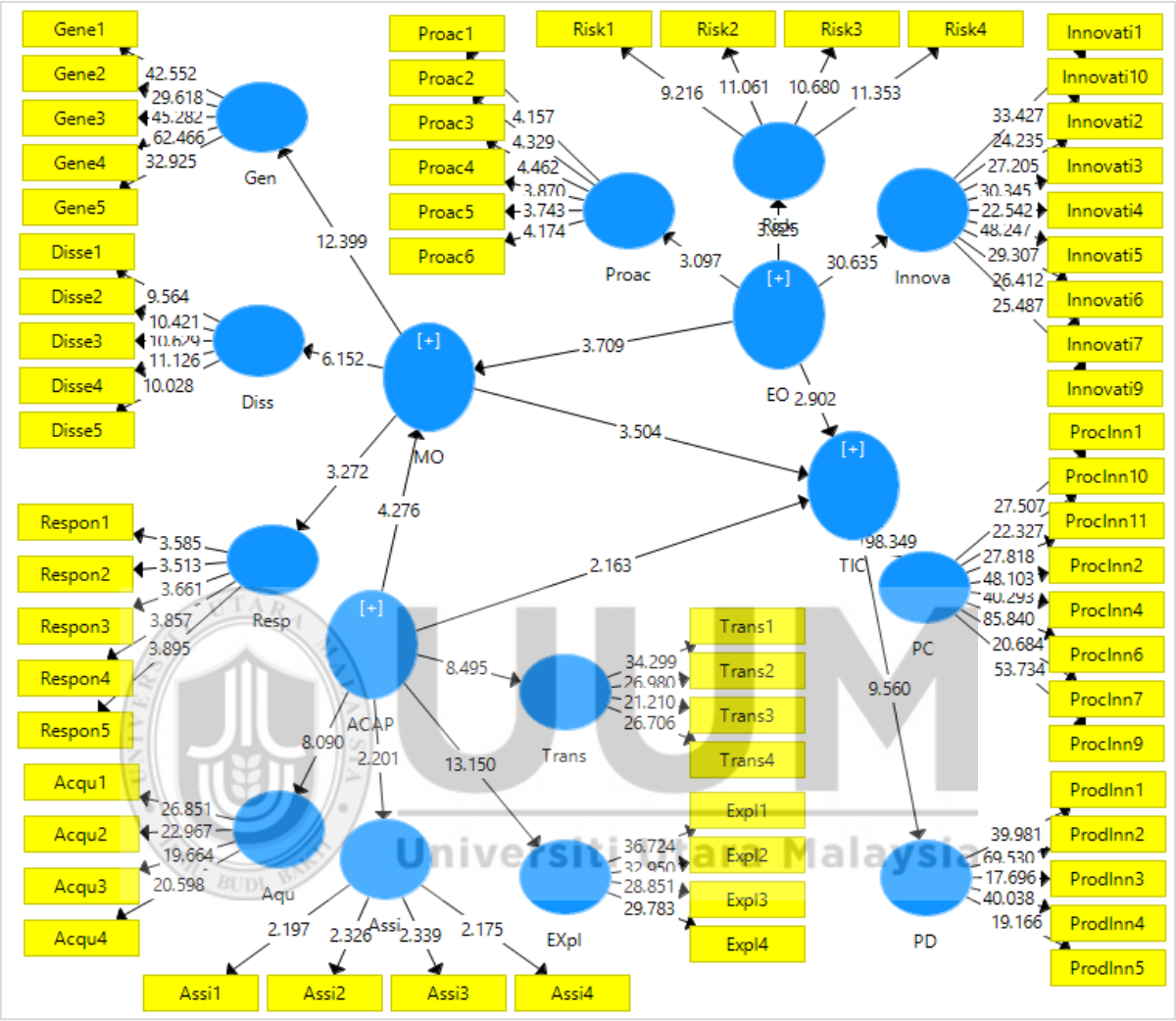

Figure 4.3 *Path Analysis Result*

The path coefficients' significance was confirmed through the bootstrapping method in Smart-PLS 3.2.0, where the t-values of each path coefficient were produced and are presented with their p-values in Table 4.15. The present study's findings gave interesting outcomes for discussion, which are an

extension of previous studies that focused on the concept of technological innovation capabilities.

Table 4.15 shows five direct hypotheses related to the study's objectives. The results reveal that the entrepreneurial orientation (EO) positively and significantly influence technological innovation capabilities (TIC) at the 0.01 significance level (β= 0.155, t=2.902, p<0.01). This result supports H_1. The relationship between absorptive capacity **(**ACAP) and TIC shows significant influence at the 0.05 significance level (β= 0.120, t=2.163, p<0.05) and thus H_2 is supported.

In addition, the results show that EO significantly influence market orientation (MO) (β= 0.188, t=3.709, p<0.001) supporting H_3. Also, H_4 is supported as ACAP significantly and positively influence MO (β= 0.233, t=4.276, p<0.001). Finally, the results show that MO significantly and positively influence TIC (β= 0.192, t=3.504, p<0.001), indicating that H_5 is supported.

Table 4.15
Results of the Structural "Inner" Model

Hyp. No.	Hypothesis Statement	Path Coefficient	Standard Error	T-Value	P-Value	Decision
H_1	Eo -> TIC	0.155**	0.053	2.902	0.004	Supported
H_2	ACAP -> TIC	0.120*	0.056	2.163	0.031	Supported
H_3	Eo -> Mo	0.188***	0.051	3.709	0.000	Supported
H_4	ACAP -> Mo	0.233***	0.055	4.276	0.000	Supported
H_5	Mo -> TIC	0.192***	0.055	3.504	0.000	Supported

*p<0.05; **p<0.01; ***p<0.001

4.6 Mediation Effect Analysis

Figures 4.4 presents the market orientation's mediating role in the theoretical framework of this study which hypothesizes that MO mediates the relationships between entrepreneurial orientation (EO), absorptive capacity **(**ACAP) and technological innovation capabilities (TIC).

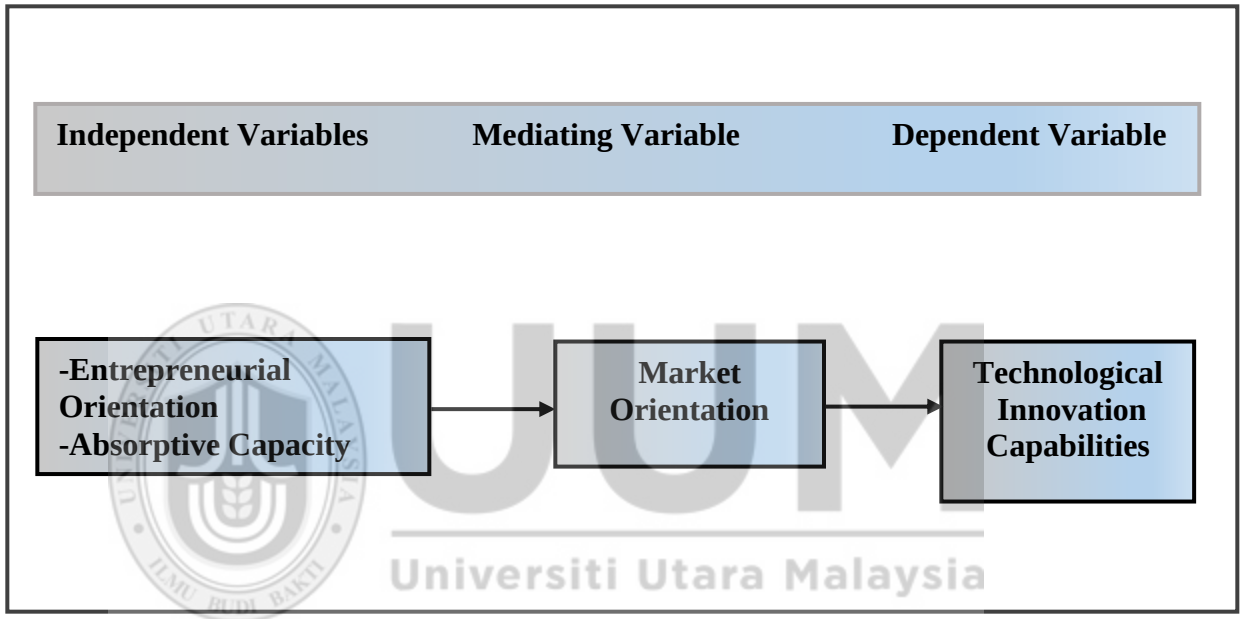

Figure 4.4 *The influences of EO, ACAP, MO on TIC*

A mediator variable was described by Baron and Kenny (1986) as a generative mechanism where the focal independent variable affects the dependent variable under study. In addition, mediation arises when a significant relationship exists between predictor and criterion variables. Therefore, a mediating variable is considered to be so if it produces an indirect effect via which the focal independent variable affects the criterion variable under investigation (Baron & Kenny, 1986). In addition, Hair *et al*., (2014) indicated that the mediator

variable has the capability of shifting some causal effects of prior variables to the next variables.

Mediating variables have a major role in psychological theory and research and such variables transmit the antecedent variables' effect to the dependent variable, thus, clarifying the relationships among these variables (Hair et al., 2014). Many approaches have been utilized to assess mediation in different researchers in the past two decades where a mediation analysis identifies the fundamental processes underlying human behavior and are important across behaviors and situations (MacKinnon & Fairchild, 2010).

After an actual mediator is identified, more accurate interventions can be developed by focusing on the variables in the mediation process (Hair et al., 2014). Several mediation analysis methods, including statistical and experimental approaches, have been used in the psychology field. Added to this, mediation analysis has become a key area for both substantive and methodological researches, where the potential mediation analysis developments help in acquiring answers about the reasons that build the relationship between variables (Hair et al., 2014; MacKinnon & Fairchild, 2010).

The direct paths model Figure 4.5 highlights the direct relationship between EO, ACAP and TIC (path c). One of the ways to measure the mediating effects is through the bootstrapping method. There is a direct relationship between EO

and TIC (β=0.155, t=2.896, p<0.01) and a direct relationship between ACAP and TIC (β=0.123, t= 2.182, p<0.05), clearly indicating significant relationships as shown in Table 4.16.

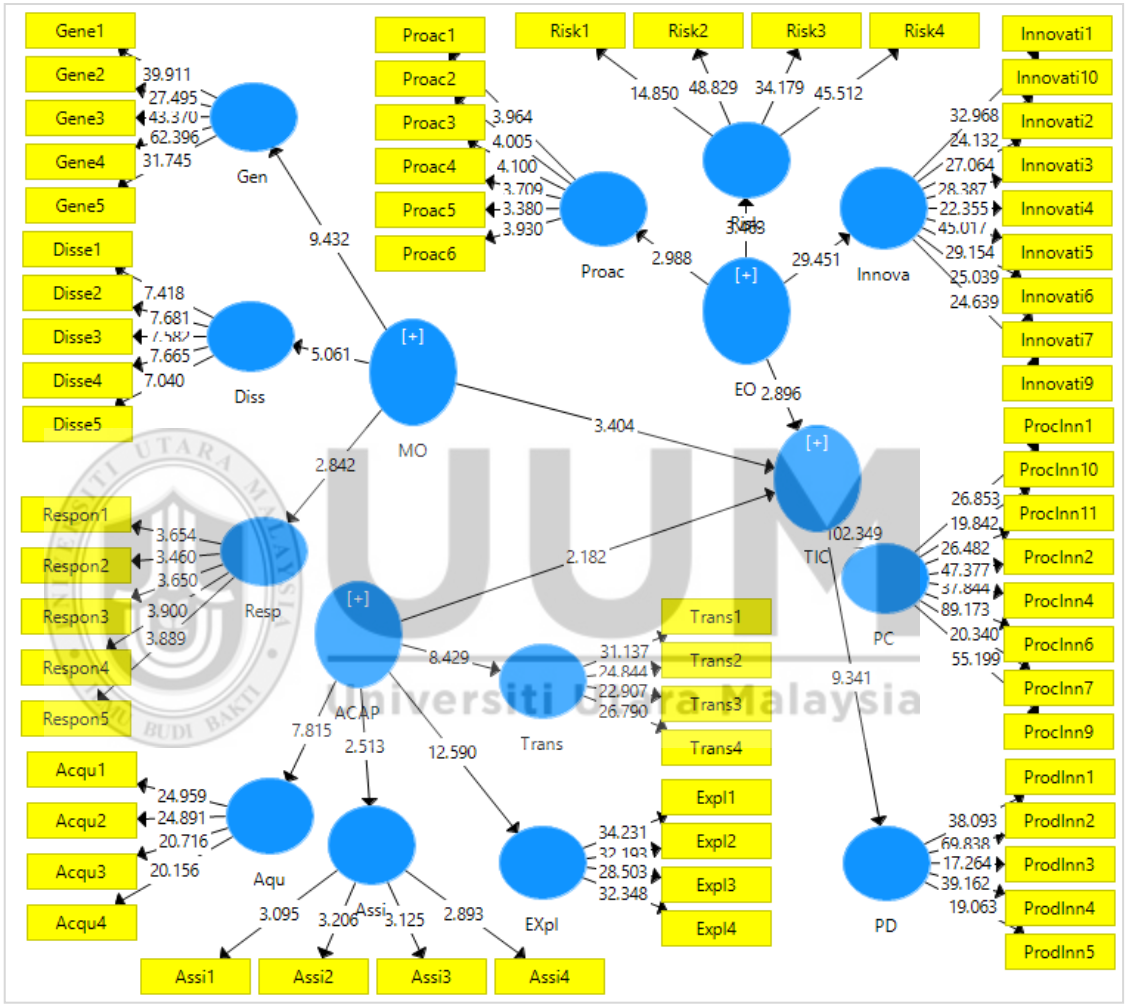

Figure 4.5 *The Direct Paths Model (c)*

Table 4.16 reveals the relationship between EO, ACAP and MO (path a) in an attempt to evaluate these paths. The direct relationship between EO and MO (β=0.188, t=3.709, p<0.001) shows that the relationship is significant at the level of significance of 0.001. Similarly, the direct relationship between ACAP and MO (β=0.233, t=4.276, p<0.001) indicates the significance of the relationship at the 0.001 significance level.

It is evident from Table 4.16 (path b) that market orientation (MO) significantly influence TIC at 0.01 level of significance (β= 0.192, t= 3.504, p<0.001). In order to obtain (c'), Table 4.16 displays the outcomes of the analysis of EO, ACAP and TIC via direct paths, in the presence of MO, Table 4.16 shows that EO significantly influence TIC at 0.01 level of significance (β= 0.155, t= 2.902, p<0.01); and ACAP significantly influence TIC at the 0.05 significance level (β= 0.120, t= 2.163, p<0.05).

In order to investigate the indirect effects of EO and ACAP on TIC via MO (paths a*b), the researcher used the bootstrapping method, which is a non-parametric approach based on re-sampling methods. It is employed for the estimation of indirect paths in order to indicate its significance. It is included in Smart-PLS and utilized to test mediation hypotheses in this study. To determine the size of indirect effect, Variance Accounted For (VAF) formula was used. This formula helps to determine the extent to which the variance of dependent variable is directly explained by independent variables and how much of that variance is explained by the indirect relationship via the mediator variable.

However, if the value of VAF is less than 20%, then we can conclude that almost no mediation effect has taken place in this given relationship. In contrast, when the VAF has more than 80% outcome, then, a full mediation effect can be assumed; while partial mediation effect take place when the outcome of VAF is higher than 20% and less than 80% (Hair et al., 2014). The following formula depicts how to calculate the VAF:

$$VAF = \frac{(\text{path a} \times \text{path b})}{(\text{path a} \times \text{path b} + \text{path c}')} \quad (1)$$

The bootstrapping test results and VAF outcomes are displayed in Table 4.16. The table presents the indirect paths of entrepreneurial orientation (EO) and absorptive capacity **(**ACAP) towards technological innovation capabilities (TIC). First, the EO-MO-TIC relationship (β=0.035, t=2.444, p<0.01), evidencing that the relationship is significant at (p<0.01). This relationship shows no mediation of market orientation (MO), given the VAF value which is 18.5%, in spite of achieving significant relationship between the variables under study. This result does not give support for H_{6a}. Second, the ACAP-MO-TIC relationship is indirect with the following results (β=0.044, t=2.672, p<0.01); hence, the relationship is significant (p<0.01) with 27% VAF value which means that MO has a partial mediating effect in this relationship and this result support H_{6b}.

Table 4.16
Testing the Mediation Effect of Market Orientation (MO)

Paths	Hypothesized Path	Path Coefficient (Direct)	Standard Error	T-Value	P-Value	VAF Method
Paths (a) Result	EO ---> MO	0.188***	0.051	3.709	0.000	-
	ACAP ---> MO	0.233***	0.055	4.276	0.000	-
Path (b) Result	MO ---> TIC	0.192***	0.055	3.504	0.000	-
Paths (c) Result	EO ---> TIC	0.155**	0.054	2.896	0.004	-
	ACAP ---> TIC	0.123*	0.057	2.182	0.030	-
Paths (c')	EO ---> TIC	0.155**	0.053	2.902	0.004	-
Result	ACAP ---> TIC	0.120*	0.056	2.163	0.031	-
*Indirect Paths When Market Orientation is Present (a*b)*	EO ---> MO---> TIC	0.035**	0.014	2.444	0.007	-
	ACAP ---> MO---> TIC	0.044**	0.017	2.672	0.004	-
VAF Values	EO ---> MO---> TIC	-	-	-	-	18.5 %
	ACAP ---> MO---> TIC	-	-	-	-	27 %

*p<0.05; **p<0.01; ***p<0.001

4.7 The Prediction Quality of the Model

The model's quality prediction is explained by R squared value in terms of size effect and predictive relevance and this is discussed in more detail in the following paragraphs.

4.7.1 R squared Value and Effect Size

The PLS-SEM only has a single measure of goodness of fit (GoF) unlike the CBSEM method. According to Tenenhaus, Vinzi, Chatelin, & Lauro (2005), a global fit measure (GOF) of PLS path modelling refers to the geometric mean of

the average communality and the endogenous constructs average R^2. Therefore, the GoF measure shows the outer and inner models' variance extracted.

The estimates of the effect size describe the significance of an effect and are not dependent on the sample size (MacKinnon & Fairchild, 2010). The following equation illustrates effect size calculation, while Table 4.17 illustrates effect size results with include and exclude exogenous variables.

$$Effect\ Size\ (f) = \frac{R^2 incl - R^2\ excl}{1 - R^2 incl} \quad (2)$$

Table 4.17
Effect Size on Endogenous Variables

Constructs		R Squared Inc.	R Squared Excl.	Effect Size
Technological Innovation Capabilities	Entrepreneurial Orientation	0.103	0.081	0.025
	Absorptive Capacity	0.103	0.09	0.014
	Market Orientation	0.103	0.07	0.037
Market Orientation	Entrepreneurial Orientation	0.098	0.036	0.037
	Absorptive Capacity	0.098	0.053	0.056

Table 4.17 shows that the effect size of the exogenous variables is small since the values for all constructs are less than 0.15 (Hair et al., 2014).

4.7.2 Cross-Validated Redundancy and communality

This section provides the predictive relevance of the endogenous constructs of this study's framework. The technological innovation capabilities (TIC)'s R squared value is 0.103, with the cross-validated communality of 0.350 and cross-validated redundancy of 0.043. As for market orientation (MO), the R

squared value is 0.098, with the cross-validated redundancy of 0.021 and cross-validated communality of 0.138 as presented in Table 4.18. The result indicates that all values are larger than zero (Hair et al., 2014), showing the path model's predictive relevance for these constructs.

Table 4.18
Prediction Relevance of the Model

Endogenous	R Square	Cross-Validated Redundancy	Cross-Validated Communality
TIC	0.103	0.043	0.350
MO	0.098	0.021	0.138

4.7.3 The Model's Overall Goodness of Fit

Unlike CBSEM, PLS-SEM technique has no sufficient global measure of goodness for the model fit. Traditionally, this lack is considered as the main drawback of using PLS-SEM (Hair, Ringle, et al., 2011). But it is necessary to realize that the meaning of the term 'fit' differs between CBSEM and PLS-SEM contexts. Where the fit logic for CBSEM depends on covariance matrix that emerges from the contradiction between the real (empirical) and theoretical models, PLS-SEM concentrates on the contradiction between the predicted values by the model in question and the observed values (within manifest variables condition) or approximated values (within latent variables condition) of the dependent variable (Hair et al., 2014).

In this study, GoF value was estimated in order to reinforce the validity of the PLS model. Accordingly, the GoF value was measured on the basis of Wetzels et al., (2009) criteria as depicted in the following formula:

$$\text{GOF} = \sqrt{(\overline{R}^2 \times \overline{AVE})} \quad (3)$$

In this study, the obtained GOF value is 0.24 as calculated by the formula.

$$\text{GOF} = \sqrt{0.10 \times 0.590} = 0.24 \quad (4)$$

The GoF baseline values are considered small when it is 0.1, medium if it is 0.25 and large if it is 0.36. In this study, the results show that the model has small GoF, indicating sufficient PLS model validity.

4.8 Chapter Summary

This study uses the Partial Least Squares Structural Equation modelling (PLS-SEM) as the analysis approach. It is relatively a new method in terms of development. In this chapter, an elaborate handling of its techniques is explained. Prior to hypotheses testing, the validity of the outer model was established as this is the standard data analysis technique used in SEM. In addition, the model's predictive power was tested and its GoF was ensured. After confirming the validity and reliability of the measurement model, the hypothesized relationships were tested. The detailed results of the hypotheses testing reflect a significant relationship between the investigated variables. Further explanation and discussion of the above results are provided in the next chapter.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the study findings, discussion of hypotheses testing and the academic contributions of the study. It also provides the research implications and limitations of the study in addition to the recommendations for future work according to the limitations. Finally, this chapter concludes the study.

5.2 Recapitulation of the Research Findings

The effect of EO on TIC within industrial SMEs is largely lacking in literature, although there are a few studies that have attempted to examine this relationship (Avlonitis & Salavou, 2007; Huang & Wang, 2011; Pérez-Luño et al., 2011). With regards to ACAP, no clear description exists about the extent to which the externally generated knowledge can affect innovation capabilities of industrial SMEs, as only a few researchers have attempted to shed light on this relationship (Li, 2011; Liao, Fei, & Chen, 2007; Srivastava, Gnyawali, & Hatfield, 2015; Sulawesi & Wuryaningrat, 2013). Therefore, the present study contributes to literature by examining these relationships in the context of industrial SMEs in the Kurdistan region of Iraq.

Added to this, it investigates the mediation effect of market orientation (MO) on the relationships between entrepreneurial orientation (EO), absorptive capacity (ACAP) and technological innovation capabilities (TIC) among industrial SMEs in the Kurdistan region of Iraq. Essentially, there are unresolved issues linked to the above relationships that calls for further in-depth research (Boso et al., 2012b; Huang & Wang, 2011; Jiménez-Jiménez & Valle, 2011; Kropp et al., 2006; Li et al., 2010; Messersmith & Wales, 2011; Otero-Neira et al., 2013; Renko et al., 2009; Tepic et al., 2014; Zortea-Johnston et al., 2011).

On the basis of the RBV, as conceptualized by Barney (1991), the study's objective is to determine the influence of entrepreneurial orientation (EO), absorptive capacity (ACAP), and market orientation (MO) on technological innovation capabilities (TIC). First, this study aims to determine the relationships between EO, ACAP and TIC; second, it aims to shed light on the relationships between EO, ACAP and MO; third, it aims to provide an insight into the relationship between MO and TIC; and lastly, it attempts to determine whether or not MO mediates the relationships between EO, ACAP and TIC.

An overview of the research objectives shows that the study basically undertakes to answer four research questions: (i) What are the relationships between EO, ACAP and TIC? (ii) What are the relationships between EO, ACAP and MO? (iii) What is relationship between MO and TIC?; and (iv) Does MO mediate the relationships between EO, ACAP and TIC?

In order to fulfil these objectives, a comprehensive literature review was conducted and incorporated throughout this study according to its relevance, particularly in chapter two, concentrating on the prior literature that related to the topic, particularly those that have focused on industrial SMEs and those related to technological innovation capabilities (TIC), entrepreneurial orientation (EO), absorptive capacity (ACAP), and market orientation (MO), were reviewed.

Prior studies have largely overlooked the industrial sector in the developing nations as most of them are dedicated to examining the relevant factors of EO, ACAP and MO and reported inconsistent findings between them and TIC.

On the other hand, not all cases have focused adequately on technological innovation and its practices within the industrial SMEs sector nor have they examined externally generated knowledge, its effect on and prediction of future customer's needs and attitudes and the development of TIC. While some researchers have explored the impact of knowledge itself rather than the process of acquisition and exploitation, others have contended that the controversy can be resolved if the influence of some variables, such as knowledge management and learning process, are better explained. Generally, the debate concerning the relationships calls for further research (Li, 2011; Yeşil et al., 2013).

Chapter three explains the data collection method employed in this study, which is the self-administrated survey distributed among the owners of industrial SMEs in the Kurdistan region of Iraq. In order to effectively generalize the research findings, 676 questionnaires were distributed randomly to the owners included in a list of 2,607 industrial SMEs according to their industrial activities and divided by three provinces in the Kurdistan region, namely: Erbil, Sulaimany and Duhok.

This method of data collection is aligned with the recommendations of studies that focused on industrial activities (Flatten, Greve, et al., 2011; Gaur et al., 2011; Saunila & Ukko, 2014). From the total number of questionnaires distributed, 646 were returned, and from the returned questionnaires, 214 were excluded owing to their failing to meet the questionnaire requirements. Hence, the number of remaining and usable questionnaires for analysis was 432, constituting an overall rate of response of 63.9%.

The factorial validity of the measurement instruments was confirmed by conducting a pilot study. A pilot study improves the measurements before the collection of actual data and assists in reformulating the ambiguous questions. To steer clear of cross-loading effects, four items were dropped at the CFA phase in order to accurately determine the measurement indicators of all the variables in the hypothesized model. Then, data was analyzed through Smart-PLS 3.2.0 software to examine the hypothesized relationships in the structural model. From the three alternatives of significance level that researchers can

choose from, the present study employed the 0.05 significance level as the critical level to accept or reject the hypotheses.

With regards to determining the answers to the research questions, the present empirical study revealed that possessing of entrepreneurial orientation (EO), absorptive capacity **(**ACAP), and market orientation (MO) dimensions in industrial SMEs in the Kurdistan region have significant effects on technological innovation capabilities (TIC). This appears to support all the major hypothesized relationships under the research questions and some indirect hypotheses.

5.3 Discussion

In order to explain the study's findings, the next sub-sections provide a discussion in the light of the study's objectives.

5.3.1 The relationships between exogenous variables (Entrepreneurial Orientation and Absorptive Capacity) and Technological Innovation Capabilities

This study looks into the structural relationships based on path coefficients to investigate the hypothesized effect of exogenous variables on TIC and they are explained below.

First, the results show that the entrepreneurial orientation (EO) - technological innovation capabilities (TIC) relationship as hypothesized in H_1 is supported as presented in Table 4.16 in Chapter 4. This result shows that EO is one of the top crucial determinants of TIC. This finding is consistent with prior studies, such as Boso et al., (2012b); Huang & Wang, (2011); Jones & Rowley, (2011); Pérez-Luño et al., (2011); Zahra, (2008); Zhou & Tse, (2005); and Zortea-Johnston et al., (2011). Despite these evidences, Messersmith & Wales (2011) elucidate a non-significant relationship between EO and small firms' innovation.

In making decisions that are related to technological innovation, enterprises are likely to consider whether or not they receive entrepreneurial opportunities. This indicates that the EO nature and its components urge the firms to consider new ideas and take part in creative venture, tolerate risks and proactive. Therefore, enterprises have several opportunities for technological innovation within EO, although it is important for them to take technological changes, industry changes, shifts in demography and changes in the macro-economy into consideration.

With respect to the Kurdistan region, it appears that EO of industrial SMEs in the Kurdistan region is a sturdy tool for achieving TIC and this may be attributed to the instability especially in light of political and security unrest which rocking Iraq from time to time, but the same cannot be said for the Kurdistan region. The region has been stabilized especially after 2003 and has

gained the benefits, with many constructed or planned projects. Thus, for enterprises looking to expand into new marketplace or products, it is a favorable opportunity to enter the growing region markets and develop their TIC and compete the imported goods.

Further, hypothesis 2 of this study examined the relationship between absorptive capacity (ACAP) and technological innovation capabilities (TIC) and the results obtained support the relationship as presented in Table 4.16 in Chapter 4. This finding shows that the more the knowledge obtained by the enterprise leads to the higher capabilities of the enterprise to produce innovative products and processes. This result is aligned with prior studies, like Caccia-Bava et al., (2006); Gebauer et al., (2012); Gray, (2006); Hurmelinna-Laukkanen, (2012); Liao et al., (2010); Miczka & Größler, (2010); and Muscio, (2007). Nevertheless, some researchers have found a non-significant relationship between knowledge acquisition and technological innovation among the industrial firms (Lee et al., 2013).

These outcomes support the hypothesis and confirm the significance of ACAP in keeping the SMEs abreast with new knowledge. The findings show the importance of externally generated knowledge in improving the enterprises' innovation capabilities, owing to the enterprises' change-oriented nature of ACAP to evolve and restructure their resource base in order to adapt to the ever-changing competitive market. These capabilities are manifested in the observable corporate structures and processes, and are ingrained in the

enterprise culture and employees' relationships and cannot be confined or attributed to a single employee.

It seems that SME owners in the Kurdistan region rely heavily on ACAP and they realize that concentrating only on existing knowledge cannot develop their innovations due to the scarcity of available knowledge for them. In addition to the limited training opportunities for their workers. Thus, acquiring externally generated knowledge could successfully enhance TIC beyond that of the firm's rivals in industrial SMEs in the Kurdistan region of Iraq. In addition, as the economy grows and enterprises need skilled workers with more specialized knowledge, informal job-search relationships may not suitable as the primary way to meet labor demand with available supply as is happening now: more developed matching processes may become needed to hire skillful workers who able to develop the TIC of the SMEs like the reliance on the official hiring offices or coordination with specialized technical institutes..

5.3.2 The relationships between exogenous variables (Entrepreneurial Orientation and Absorptive Capacity) and Market Orientation

Similar results were revealed for the significant effect on market orientation. Specifically, the entrepreneurial orientation (EO) - market orientation (MO) relationship as hypothesized in the third hypothesis is supported by the result as presented in Table 4.16 in Chapter 4. This result shows that entrepreneurial

orientation (EO) is one of the crucial determinants of market orientation (MO) of the industrial SMEs in the Kurdistan region of Iraq.

The result is aligned with prior studies (Atuahene-gima & Ko, 2001; Blesa & Ripolles, 2003; Zahra, 2008) that concluded that firms displaying entrepreneurial behavior have a greater tendency towards market orientation. If achieved, this will have a positive effect on profitability and sales growth and it will assist in enhancing the rate of success when it comes to products and process launch. Nevertheless, the result of Lin et al., (2008) study indicates a non-significant effect of EO on MO, which is the same result reached by Aljanabi and Noor (2015b).

The main reason why entrepreneurial orientation (EO) serves as a catalyst to MO is that EO enhance information acquisition about markets; this enhancement is reflected on intelligence generation and dissemination as dimensions of market orientation (MO). The results of this study confirm that entrepreneurially-oriented firms tend to possess high level of MO.

In the Kurdistan region of Iraq, this may be attributed to awareness of the SME owners of the nature of their environment, as competition is especially severe with the imported goods, requiring companies to raise their entrepreneurial and market orientations to increase their innovation capabilities, Where focusing only on market orientation without taking into account the entrepreneurial orientation may expose the enterprises to the risk of failure through their

endeavor to meet the infinite needs and desires of their customers. Thus, owners of industrial SMEs are advised to evaluate risks, and, if possible, put off the high risk projects in order to gain better opportunity to compete the imported products.

As for the absorptive capacity **(**ACAP) – market orientation (MO) relationship as addressed in hypothesis 4, the findings show support for the relationship and it is aligned with prior studies like Chang et al., (2013); Flatten, Greve, et al., (2011); Hodgkinson et al., (2012) and Jantunen, (2005).

On the other hand, this finding is inconsistent with the result of Kotabe et al., (2011) who found that knowledge acquisition from outside fails to enhance responsiveness to the market and customers' needs. Indeed, in related literature of MO, there is a lack of studies on the effect of ACAP on the SMEs' MO behavior (Aljanabi & Noor, 2015b).

This result indicates that firms with high ability for acquisition of external knowledge are capable of not being overly dependent on market feedback in their development of products. As such, they do not require direct market indications as a way to develop products and processes. Moreover, these findings demonstrate that MO can inundate an organization with information and so an adequate ACAP can lead to sufficient knowledge being discriminated from that information overload to inform and enable effective

market decision-making. Finally, this result suggests that ACAP may then explain how enterprises create unique distinctions from their MO.

Such results reflect that the enterprises in the Kurdistan region rely on external parties for the development of successful innovation, due to the isolation of Iraq generally, and the Kurdistan region, particularly, for a long period from industrial developments given the economic embargo conditions of the 1990s which weakened the enterprises' ability to generate their own internal knowledge. Thus, owners of industrial SMEs are advised to "think globally and act locally" to be able to acquire the new related knowledge that meet customers renewed needs and compete different imported goods.

5.3.3 The relationship between Market Orientation and Technological Innovation Capabilities

The third aim of this study is to examine the relationship between market orientation (MO) and technological innovation capabilities (TIC), as hypothesized in $H_{5.}$ As presented in Chapter 4, specifically in Table 4.16, a significant relationship was revealed between the two variables. Such result is aligned with Baker & Sinkula, (2009); Grinstein, (2008a); Jiménez-Jimenez et al., (2008); Kohli et al., (1993); and Cheng Lu Wang & Chung, (2013). Nevertheless, others have found no relationship between MO and innovation (Blesa & Ripolles, 2003; Chao & Spillan, 2010).

To maintain the innovation of SMEs, it is important for owners to concentrate on MO, given its role in providing an insight into the customers' needs and in lessening the innovation failures. As a result, high MO firms can identify emerging market trends and the opportunities within industries. These in turn allow firms to provid the new products that improve their growth, development and financial performance. Further, managers in various industries could do better by creating capabilities and implementing systems that contribute to the MO of the firm that make MO play a significant role in harnessing the TIC of the firm to achieve growth and profitability.

Finally, this study suggests that the enterprises trying to consolidate innovation capabilities should develop a MO behavior. This will enable enterprises to anticipate and comprehend better the customers' potential and current needs and the competitive status, to handle this information faster and to produce new products or processes that can allow them to ascertain competitive advantage.

In the Kurdistan region, this could be ascribed to two aspects: the first is related to steep competition for imported products; and the second is related to a lack of information and studies about customers and their preferences, pushing the enterprises to use MO as a means of strengthening their TIC.

5.3.4 The Mediation role of Market Orientation

This section examines the results of two hypotheses concerning the mediating effect of MO on the relationships between entrepreneurial orientation (EO) and technological innovation capabilities (TIC), and between absorptive capacity **(**ACAP) and TIC.

First, the mediating effect of MO on the EO-TIC relationship was hypothesized in hypothesis 6_a. Based on the statistical results, no mediation effects were found of MO on the relationship between EO and TIC

The finding concerning the mediating effect of MO on the entrepreneurial orientation (EO)- technological innovation capabilities (TIC) relationship was expected to be consistent with the RBV (Boso et al., 2012b; Cervera et al., 2001; Morris et al., 2007; Otero-Neira et al., 2013; Zahra, 2008). However, the findings do not indicate the potential mediation impact hypothesized by this study. This may be attributed to the instability of the economic situation and the large influx of imported goods which have contributed to the production of a few dangerous products and manufacturing process regardless of renewable customers' needs. Although the respondents are aware of MO's role and its impact on the development of innovation capabilities, the results do not reflect the adopted mechanism in the examined firms.

Despite the possibility of arguing that the obtained result about EO-MO relationship is aligned with prior results, and it appears to substantiate the

claims by prior authors, especially those who have stressed on the danger of consumer-oriented innovation (Atuahene-Gima et al., 2005; Baker & Sinkula, 2009; Blesa & Ripolles, 2003; Lin et al., 2008), it may be stated that heavy stress on MO may negatively impact innovation. Such innovation could force a firm to take consumers' short-term needs into consideration and confine itself to conducting incremental innovations within the current technological paradigm. Hence, entrepreneurial orientation (EO) could play an important and direct role to reduce such cases.

Unexpectedly, this finding does not support H_{6a} on the positively significant role hypothesized. Previous empirical researches demonstrate that MO plays a mediating role with regards to the relationship between entrepreneurial orientation and innovation capabilities. This result however, may be attributed to the fact that the capacity of industrial SMEs in the Kurdistan region is lower than the expectations of customers, and that explains the large number of imported products from abroad that compete intensely with the local products. Thus, these enterprises do not rely heavily on customers' expectations to develop their innovations.

Second, the mediation effect of MO on the absorptive capacity **(**ACAP) - technological innovation capabilities (TIC) relationship as depicted in hypothesis 6_b - the results show partial mediation of MO on this relationship. The results show that high level of ACAP of the enterprise directly affects the

TIC of the industrial SMEs in the Kurdistan region and indirectly by enhancing the level of MO.

This result is supported by a wide stream of literature (Baker & Sinkula, 1999, 2005, 2007; Lee & Tsai, 2005; Olavarrieta & Friedmann, 2008). One explanation for this result is the indispensable role of MO in determining future directions for innovation in terms of current and future expectations of customers, and it indicates the nature of the relevant knowledge gathered from outside the firm and combined with past knowledge to meet potential customers' needs. Hence, MO is considered as a catalyst for survival and to prevent firms from going in the wrong direction.

These results indicate that the ACAP attitude within industrial SMEs in the Kurdistan region use MO as a mechanism to enhance TIC. One plausible explanation for this finding is the modest capabilities of the enterprises to generate new knowledge about their products and processes; thus, they try to imitate some of the successful products to satisfy the desires of customers. Thus, to avail from future opportunities, the Kurdistan region government is advised to improve industrial SMEs' productivity by investment in integrated technology and link with the global and regional markets to promote their products internationally.

As a consequence, the results support the study's framework in that the SME owners should focus more on MO behaviors and in doing so, fortify TIC. This can enable them to respond to changes in customers' preferences and to respond to market changes to achieve competitive advantage by introducing new products and processes.

5.4 Research Contributions and Implications

Several insights concerning the issues of TIC within SMEs have been discussed throughout this study. To the best of the researcher's knowledge, this study is one of the very few studies that has been carried out in developing countries, particularly in the private sector to investigate the effect of EO, ACAP and MO on TIC.

Added to this, this study contributes to expanding current literature related to examining the mediating role of MO on the EO-TIC relationship on the one hand, and on ACAP-TIC relationship on the other with the help of the PLS-SEM. Moreover, by including the examination of the effect of EO, ACAP and MO, the present study contributes to both literature and practice. The study's contributions are enumerated in the following sub-sections.

5.4.1 Theoretical Contributions

The study contributes to the literature concerning TIC and the antecedent factors that have the potential to affect such capabilities, given the mixed findings reported by past studies (Boso et al., 2012b; Huang & Wang, 2011; Jiménez-Jiménez & Valle, 2011; Kropp et al., 2006; Li et al., 2010; Messersmith & Wales, 2011; Otero-Neira et al., 2013; Renko et al., 2009; Tepic et al., 2014; Zortea-Johnston et al., 2011). The research also provides an insight into the TIC framework which is important to organizations in their assessment of potential capabilities and their use of such capabilities with the help of modern technology. This could be a significant contribution given the paucity in the theoretical frameworks and the significant gaps in the extant literature (Camisón & Villar-López, 2012b; Tepic et al., 2014; Türker, 2012; Zawislak et al., 2012).

In addition, this study also contributes to the development and explanation of entrepreneurial attitudes towards technological innovation in the context of the industrial sector in the Kurdistan region of Iraq. This study contributes by stressing on the role of acquiring and benefitting from the externally generated knowledge on TIC of industrial SMEs, the use of such knowledge in reacting to customers' needs and the development of SMEs' TIC.

Accordingly, this research aims to determine the factors affecting technological innovation capabilities (TIC). Accordingly, the researcher conducted an evaluation of the relationships between entrepreneurial

orientation (EO), absorptive capacity (ACAP) and market orientation (MO), as antecedents of TIC. It empirically examined the existing literature and developed arguments upon it to measure antecedents of TIC via the inclusion of a mediating variable, MO.

The major contribution of the present study is in minimizing the gap in the past literature as highlighted by Avlonitis & Salavou, (2007); Boso et al., (2012b); Huang & Wang, (2011); Otero-Neira et al., (2013); and Pérez-Luño et al., (2011), which are among the studies concerning the relationship between EO and TIC.

Thus, this study contribute to the RBV by highlighting the role of entrepreneurial orientation (EO) as an essential resource to enhance TIC within the industrial SMEs. This study gives particular importance to the role of entrepreneurial orientation in fast responding to the opportunities of new products and process innovations, which emerge when some entrepreneurs have shrewdness into the value of some resources that others do not. Ren and Yu (2016) argue that the EO has a great impact on improve the firms' renewal capability and organizational learning capability specially for new enterprises. In a similar vein, this study contribute to the RBV by emphasize on the role of EO on growth of new enterprises as substantial component in the exploitation of sophisticated technologies and unique tool for competition and hence hard to imitate.

Further, it is trying to enrich the literature of technological innovation capabilities by adopting the RBV (Camisón & Villar-López, 2012a; Cohen & Levinthal, 1990; Jung-Erceg et al., 2007; Lawson & Samson, 2001; Narvekar & Jain, 2006; Zhou et al., 2010) and discussing the resources that have significant influences on technological innovation capabilities.

The present study contributes by clarifying the inconsistency that exists in literature regarding the aforesaid relationships among SMEs as urged by Avlonitis & Salavou, (2007); Huang & Wang (2011); and Pérez-Luño et al., (2011), who stated that the role of EO in enhancing innovation capabilities still needs further investigation.

Moreover, there is an evident lack of research that has examined the role of ACAP on TIC as mentioned by Cheng & Chen, (2013); Li (2011); Liao et al., (2007); Srivastava et al., (2015); and Sulawesi & Wuryaningrat, (2013). Some researchers tried to fill this gap in literature by investigating the organizational learning but with different dimensions from ACAP (Huang & Wang, 2011; Jiménez-Jimenez et al., 2008; Jiménez-Jiménez & Valle, 2011). Added to this, mixed results have been reported concerning the relationship and learning processes itself may vary among firms, thus bringing about different findings (Baker & Sinkula, 2007; Flores, Zheng, Rau, & Thomas, 2010; Jiménez-Jiménez & Valle, 2011).

Within the scope of absorptive capacity (ACAP), this study has made significant contributions in RBV given to the rapidly growing area of dynamic capabilities (Flatten, Greve, et al., 2011; Javalgi, Hall, & Cavusgil, 2014). The emphasis on firms' ability to absorb externally generated knowledge has contributed to the interaction, learning and knowledge management issues. Firms' absorptive capacity could be imitable but accumulated knowledge which develop over time, could be unique to a specific firm and contribute to the induction of particular human capital skills that could enhance technological innovation capabilities. In addition, employee behavior also represents an important component of ACAP that affects innovation capabilities. Thus, this study contribute to the RBV by highlighting the role of ACAP as an essential resource to enhance TIC within the industrial SMEs.

This study also contributes to empirical testing of the proposed model of technological innovation based on literature review of market orientation. This was recommended by Lin et al., (2008) when they stressed on the importance of investigating the mediating role of MO on the entrepreneurial orientation-innovation relationship; and by Hodgkinson et al., (2012) who showed the dependency of market orientation on absorptive capacity to achieve high performance.

Thus, this study contribute to the RBV by highlighting the mediating role of MO as core intangible resource can give an understanding of the characteristics of other resources (e.g. ACAP) that need to be utilized in the firm to generate customer value in term of specific characteristics. Simultaneously, since marketing aims to enhance and expedite the implementation of other main organizational objectives, it is expected that MO will give a share in non-marketing activities and that are in support of technological innovation capabilities. Moreover, this study propose the need for the RBV and MO to directly connect customers' need changes to the need for changes in main resources.

Hence, the model of the current study contributes through its provision of two mechanisms that may be utilized by industrial SMEs to improve their TIC. The first one is a balancing mechanism that is provided by the effects of EO and MO. As earlier mentioned, the concentration on one of the two orientations and the exclusion of another may adversely impact the competitive ability of the enterprise. For example, broad emphasis on entrepreneurial efforts can confuse firms' existing capabilities, if these activities are exposed to failure. On the other hand, if the stress is overly made on the MO operations, firms may find it challenging to steer clear of demanding customers (Hughes et al., 2007; Boso et al., 2012b). Therefore, Blesa and Ripolles (2003) emphasis was on the impact of entrepreneurial proactiveness on new product success and they concluded that firms having

high degrees of proactive behavior are more inclined to be innovative through MO adoption also.

The second mechanism is the responding and filtering mechanism, provided by the integrating effects of both ACAP and MO. This is because the mere existence of external knowledge about customers and markets does not necessarily mean firms can utilize it easily. In addition, some aspects of SMEs' innovation are constantly outward-oriented owing to their close interaction with customers. For example, MO and its dimensions of intelligence generation and responsiveness, include expecting and reacting to future needs of customers and market, thus developing a first-initiative preference compared to rivals (Aljanabi & Noor, 2015b; Hodgkinson et al., 2012).

As time passes, this can lead to increased acquired knowledge, whereby decision-makers become overloaded with information. This may adversely impact their decision-making (Iii et al., 2009). On the other hand, ACAP acts as a filtering mechanism to acquire and assimilate only the relevant and needed knowledge and then, transform these knowledge packs into valuable outcomes (Hodgkinson et al., 2012). Accordingly, the majority of SMEs seek to fill the internal deficit through the use of knowledge that can be found outside of its borders (Celuch & Murphy, 2010; Muscio, 2007). The ability of the enterprise to interpret and exploit knowledge is crucial when it comes to new knowledge access, whereas the lack of such ability may sometimes

prevent or undermine the innovation capabilities of the SMEs (Muscio, 2007). Such ability enhances SMEs capability to respond to their customers' needs (Boso et al., 2012a, 2012b; Huang & Wang, 2011).

Finally, opposed to majority of the prior studies that have focused on the developed countries and mature economies, this study focuses on developing economies in the Kurdistan region of Iraq, given the importance of technological innovation and SMEs in Kurdistan economic development plans. This study concentrates on SMEs in the Kurdistan region of Iraq as a trial to contribute and add practical insights to the literature on this subject. Thus, this study and in the light of Barney (1991) work, contributes to the RBV by suggesting specific mix of resources (EO, ACAP, and MO) that expected to be needed to enhance firms' technological innovation capabilities.

5.4.2 Practical Implications

The obtained results have important implications for practitioners and policy-makers. They provide beneficial and enlightening insights on the way entrepreneurial orientation (EO), absorptive capacity **(**ACAP) and market orientation (MO) can improve the technological innovation capabilities (TIC) of industrial SMEs. The following sub-sections further clarify these insights.

First, the study's findings can enlighten the institutions working in the Kurdistan region on the significance of technological innovation to support SME owners in different industries. The results also explain that technological

innovation is one of the major survival characteristics of an enterprise that is seeking to achieve a strategic position in the marketplace. Leveraging the findings may enable industrial SMEs in the Kurdistan region of Iraq to follow effective plans to improve their innovation level through authentic knowledge that can enhance product and process development.

Second, the measurement of industrial SMEs' technological innovation capabilities can help enterprises to realize and achieve a high degree of innovation by dealing with factors affecting such capabilities, as they play a significant role in the innovation level.

Third, the findings of this study confirm that the market orientation positively mediates the relationship between ACAP and TIC. Thus, it confirms that good MO can improve the enterprises' attitudes to acquiring the related knowledge and make the enterprises more capable of innovating. Accordingly, it is suggested that the paradigm of acquiring external knowledge of enterprises needs to shift from single-loop of learning (the relationship between market orientation and technological innovation capabilities) to double-loop (the relationship between absorptive capacity and technological innovation capabilities through market orientation), from continuous improvement to innovative improvement, given the feedback loop that exists between market orientation and the sub processes of absorptive capacity, especially acquisition and assimilation of knowledge. Where ACAP may play a filtering role, it limits the type and amount of new information that enterprises acquire and

assimilate, which in turn influences the enterprise's interpretations and dissemination of this information. Thus, it is one of the purposes of this study to evaluate the acquiring of external knowledge and its influences on innovation capabilities through market orientation.

Despite the fact that the proposed mediating role of MO on the relationship between entrepreneurial orientation **(**EO) and technological innovation capabilities (TIC) is not proven by the results, it confirms the positive impact of MO on TIC, suggesting that the potential value of MO should be taken into consideration along with other important firm capabilities, like EO, to maximize firms' abilities to react to opportunities and threats, given the substantial role of MO in providing a platform to achieve entrepreneurial activities. More specifically, both market-oriented and entrepreneurial firms should strive to satisfy expressed and latent customer needs, pursue market expansions as they are identified and capitalize on emerging opportunities.

Fourth, this study has implications for policy-makers as it provides an insight into the way through which SMEs can support their innovation capabilities using their resources. This could assist the policy-makers in their issuance of regulations that urge market practices to support the maximization of SMEs' innovative capabilities, and improve the relationship between government entities and industrial SMEs as the pillar of economic development of the country.

Lastly, the study's results are invaluable for industrial banks and industrial and trade chambers that offer financial and organizational services for industrial SMEs to evaluate SMEs' abilities to achieve market success. These results can form an accurate guide for decision-makers in these entities on how to evaluate such capabilities and to allocate incentives for their promotion, which in turn, can lead to economic sustainability.

5.5 Limitations of the Study

Although this study has numerous contributions, the interpretation of outcomes and the drawn conclusions should take into consideration the study's limitations. Several limitations are noted and are reported in this section. The main limitations of this study can be categorized into four major types: generalization, causation, research design and the scope of the study. Further details are provided in the following paragraphs.

There are some factors that are beyond the control of the researcher and consequently have led to some limitations in terms of generalizability. First, the study's results and drawn conclusions are according to the data gathered form industrial SME owners based on their perceptions of entrepreneurial orientation **(**EO), absorptive capacity **(**ACAP), market orientation (MO) and technological innovation capabilities (TIC) at a single point of time. In other words, this study overlooks the ongoing changes in the psychological human aspects that could occur among SME owners owing to their developing experiences and the differences in environmental conditions over time. This

happens when data are gathered through a cross-sectional approach with no follow-up data. On this basis, the study's conclusions could be different if the adopted research design had been longitudinal rather than cross-sectional.

Second, the industrial SMEs in the Kurdistan region of Iraq are considered to be one of the top industrial sectors in the whole region but it would still be challenging to generalize the results on the whole industrial sector, or to other sectors due to the fact that the obtained results on the different effects of TIC's antecedents may differ from one sector to another.

The researcher employed a survey questionnaire design with a cross-sectional technique, where data were gathered at one single point of time. In a survey design, information obtained only indicates the level of variables' association and while the causal relationships are inferred on the basis of the results obtained, it is difficult to accurately ascertain them.

Additionally, an extensive review of literature shows that entrepreneurial orientation **(**EO), absorptive capacity **(**ACAP) and market orientation (MO) serve as catalysts to technological innovation capabilities (TIC) of industrial SMEs. Based on this fact, the association between them examined at one point in time will not capture the accuracy as the results will depend on the time of their application. This shows that the examination of these factors' effect on TIC is better conducted through longitudinal studies.

As with other studies, this study's limitations are also present in its methodological aspects. Like other studies that employ the quantitative research design, this study's respondents were asked for their perceptions of statements provided in the questionnaire, and such perceptions were gauged through a Likert scale. The respondents' answers may be influenced by their biased perception of the phenomenon (Bryman & Bell, 2011). As such, this study proposes that future research that investigates the relationships of EO, ACAP and MO with TIC look into employing mixed research design (quantitative and qualitative research design) to complement each other.

Although several insights are obtained from the results, this study is limited to the investigation of the internal factors affecting the capabilities of industrial enterprises for innovation. A more sophisticated attitude would provide a deeper insight regarding external factors affecting TIC of enterprises, like intensity of competition and technological turbulence.

5.6 Directions for Future Research

Throughout this study, several recommendations for future studies have been raised. As discussed in the limitation part of this study; the cross-sectional design was used for data collection. Such method collects data at a single point of time which limits the observance of the interactive relationships between EO, ACAP and MO and their effects on TIC. As such, a case study approach will allow a deeper investigation into the complex relationship

among the variables and thus, the results may add new insights into different success factors.

The second recommendation pertains to the combined effect of entrepreneurial orientation **(**EO), absorptive capacity **(**ACAP) and market orientation (MO) on the SMEs technological innovation capabilities (TIC) that could be extended through a longitudinal method as this method could provide long-term insight into the relationship. This approach could show the variables' development and detect the relationships clearly.

Third, the study focuses on the industrial SMEs in the Kurdistan region of Iraq listed under the Ministry of Trade and Industry in Kurdistan region. Further studies could investigate the relationships between examined variables in public industrial enterprises or other private sectors.

Fourth, the present study recommends future studies to include the effect of several other variables to further shed light on the TIC of SMEs. Finally, to draw a generalizable conclusion on the Kurdistan region of Iraq and other developing nations with similar cultural practices, more studies should be undertaken to examine the effect of EO, ACAP, and MO on TIC. For further investigations, the same study model can be empirically tested on data gathered from other countries having different cultural practices.

5.7 Conclusion

The current competitive and challenging business environment has precipitated the investigation of the constructs of technological innovation capabilities in the fields of management and marketing. Knowledge about customers is the main focus of this study where customers are deemed to be the primary partners to achieve firm success. In other words, it is pertinent for firms to respond to the needs of customers and satisfy them in order to thrive and develop. The improvement of SMEs' TIC has been the focus of decision-makers in developing nations, including the Kurdistan region of Iraq. Further, entrepreneurial orientation **(**EO), absorptive capacity **(**ACAP) and market orientation (MO) have been widely acknowledged as good factors that influence technological innovation capabilities (TIC) of industrial SMEs.

Measuring the TIC levels assists the organizations to achieve superior performance and launch products and processes. In the context of the Kurdistan region of Iraq, the significance of industrial SMEs has been extensively acknowledged due to their effective role in economic activities.

The present study made use of the PLS-SEM as a relatively new method in the field of marketing and management sciences.

The study's results evidence the significant and direct impact of EO, ACAP and MO on TIC. Enhancing these factors among industrial SMEs can help enhance their innovation level. Added to this, the mediating role of MO on the

ACAP-TIC relationship is partially supported, while such role is not proven in the EO-TIC relationship. The study's results show that the efforts of industrial SMEs in the Kurdistan region of Iraq should be according to accurate knowledge concerning customers' needs and requirements in order to gain their interest and trust in new products, which indicate the need to employ a dependable MO behavior that can provide the feedback about customers. More importantly, it is pertinent for the industrial sector to conduct surveys regularly to measure the potential needs of customers and obtain feedback on how to enhance their products and processes. To conclude, the industrial sector in the Kurdistan region of Iraq should directly focus on their TIC and ensure that their efforts and activities are aligned with the requirements of their customers for innovative products and processes.

REFERENCES

Abdul Aziz, R., Mahmood, R., Tajudin, A., Abdullah, M. H., Aziz, R. A., Mahmood, R., … Abdullah, M. H. (2014). The relationship between entrepreneurial orientation and business performance of SMEs in Malaysia. *International Journal of Management Excellence*, *2*(3), 221–226. doi:10.0001%2Fijme.v2i3.96

Adhikari, A., & Gill, M. (2012). Impact of Resources Acpabilities and Tchnology on Market Orientation of India B2B Firms. *Journal of Services Research*, *11*(2), 75–98.

Adler, P., & Shenhar, A. (1990). Adapting Your Technological Base: The Organizational Challenge. *Sloan Management Review*, *32*(1), 25–37.

Al-Hyari, K., Al-Weshah, G., & Alnsour, M. (2012). Barriers to internationalisation in SMEs: evidence from Jordan. *Marketing Intelligence & Planning*, *30*(2), 188–211. doi:10.1108/02634501211211975

Ali, F. (2013). The reality of economic diversification in the Kurdistan region of Iraq. Retrieved from http://kawanakurd.com

Aljanabi, A. R. A., & Noor, N. A. M. (2015a). Critical Determinants of Technological Innovation: A Conceptual Framework and a Case Study from Iraq. *International Business Research*, *8*(2), 16–27. doi:10.5539/ibr.v8n2p16

Aljanabi, A. R. A., & Noor, N. A. M. (2015b). The Mediating role of Market Orientation on Entrepreneurial Orientation, Absorptive Capacity and Technological Innovation Capabilities. *Asian Social Science*, *11*(5), 219–234. doi:10.5539/ass.v11n5p219

Alpkan, L., Bulut, C., Gunday, G., Ulusoy, G., & Kilic, K. (2010). Organizational support for intrapreneurship and its interaction with human capital to enhance innovative performance. *Management Decision*, *48*(5), 732–755.

doi:10.1108/00251741011043902

Alpkan, L. ütfiha., Şanal, M., & Ayden, Y. ükse. (2012). Market Orientation, Ambidexterity and Performance Outcomes. *Procedia - Social and Behavioral Sciences*, *41*, 461–468. doi:10.1016/j.sbspro.2012.04.056

Al-Swidi, A. K., & Mahmood, R. (2012). Total quality management, entrepreneurial orientation and organizational performance: The role of organizational culture. *African Journal of Business Management*, *6*(13), 4717–4727. doi:10.5897/AJBM11.2016

Alvarez, S. a. (2001). The entrepreneurship of resource-based theory. *Journal of Management*, *27*(6), 755–775. doi:10.1177/014920630102700609

Amiryany, N., Huysman, M., Man, A.-P. De, & Cloodt, M. (2012). Acquisition reconfiguration capability. *European Journal of Innovation Management*, *15*(2), 177–191. doi:10.1108/14601061211220968

Anca, L., & Cruceru, F. (2012). Achieving marketing success through strategic orientation of the organisation. *Romanian Journal of Marketing*, *4*(4), 29–32.

Andersén, J. (2012). Protective capacity and absorptive capacity: Managing the balance between retention and creation of knowledge-based resources. *The Learning Organization*, *19*(5), 440–452. doi:10.1108/09696471211239730

Andersén, J., & Kask, J. (2012). Asymmetrically realized absorptive capacity and relationship durability. *Management Decision*, *50*(1), 43–57. doi:10.1108/00251741211194868

Anderson, J. C., & Gerbing, D. W. (1991). Predicting the performance of measures in a confirmatory factor analysis with a pretest assessment of their substantive validities. *Journal of Applied Psychology*, *76*(5), 732–740. doi:10.1037//0021-9010.76.5.732

Ar, I. M., & Baki, B. (2011). Antecedents and performance impacts of product versus process innovation: Empirical evidence from SMEs located in Turkish science and technology parks. *European Journal of Innovation Management*, *14*(2), 172–206. doi:10.1108/14601061111124885

Armstrong, J. ., & Overton, T. (1977). Estimating Nonresponse Bias in Mail Surveys The Wharton School , University of Pennsylvania Terry S . Overton Marketing Scientist , Merck , Sharp and Dohme. *Journal of Marketing Research*, *14*(1), 396–402.

Astrachan, C. B., Patel, V. K., & Wanzenried, G. (2014). A comparative study of CB-SEM and PLS-SEM for theory development in family firm research. *Journal of Family Business Strategy*, *5*(1), 116–128. doi:10.1016/j.jfbs.2013.12.002

Atkinson, W. (2014). Iraq's Kurdistan Region Stable and Growing. Retrieved from https://www.pmi.org/learning/PM-Network/2014/kurdistan-growing-and-stable.aspx

Atuahene-gima, & Ko. (2001). An Empirical Investigation of the Effect of Market Orientation and Entrepreneurship Orientation Alignment on Product Innovation. *Organization Science*, *12*(1), 54–74. doi:org/10.1287/orsc.12.1.54.10121

Atuahene-Gima, K., Slater, S. F., & Olson, E. M. (2005). The Contingent Value of Responsive and Proactive Market Orientations for New Product Program Performance. *Journal of Product Innovation Management*, *22*(6), 464–482. doi:10.1111/j.1540-5885.2005.00144.x

Avlonitis, G. J., & Salavou, H. E. (2007). Entrepreneurial orientation of SMEs, product innovativeness, and performance. *Journal of Business Research*, *60*(5), 566–575. doi:10.1016/j.jbusres.2007.01.001

Babbie, E. (2011). *Introduction to Social Research* (Fifth Edit.). Canada: Learning,

Wadsworth Cengage.

Baer, M. (2012). Putting Creativity to Work: The Implementation of Creative Ideas in Organizations. *Academy of Management Journal*, *55*(5), 1102–1119. doi:10.5465/amj.2009.0470

Bakar, & Mahmood, R. (2014). Linking Transformational Leadership and Corporate Entrepreneurship to Performance in the Public Higher Education Institutions in Malaysia. *Advances in Management & Applied Economics*, *4*(3), 109–122. doi:10.1016/j.jbusvent.2005.02.005

Bakar, L. J. A., & Ahmad, H. (2010). Assessing the relationship between firm resources and product innovation performance: A resource-based view. *Business Process Management Journal*, *16*(3), 420–435. doi:10.1108/14637151011049430

Baker, W. E., & Sinkula, J. M. (1999). The Synergistic effect of Market Orientation and Learning Orientation on Organizational Performance. *Journal of Academy of Marketing Science*, *27*(4), 411–427. doi:10.1177/0092070399274002

Baker, W. E., & Sinkula, J. M. (2005). Market Orientation and the New Product Paradox. *Journal of Product Innovation Management*, *22*(6), 483–502. doi:10.1111/j.1540-5885.2005.00145.x

Baker, W. E., & Sinkula, J. M. (2007). Does Market Orientation Facilitate Balanced Innovation Programs? An Organizational Learning Perspective. *Journal of Product Innovation Management*, *24*(4), 316–334. doi:10.1111/j.1540-5885.2007.00254.x

Baker, W. E., & Sinkula, J. M. (2009). The complementary Effects of Market Orientation and Entrepreneurial Orientation on Profitability in Small Businesses. *Journal of Small Business Management*, *47*(4), 443–464. doi:10.1111/j.1540-627X.2009.00278.x

Baregheh, A., Rowley, J., & Sambrook, S. (2009). Towards a multidisciplinary definition of innovation. *Management Decision*, *47*(8), 1323–1339. doi:10.1108/00251740910984578

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, *17*(1), 99–120. doi:10.1177/014920639101700108

Barney, J. ., Xue, L., & Ray, G. (2013). Impact of Information Technology Capital on Firm Scope and Performance: The Role of Asset Characteristics, *56*(4), 1125–1147.

Barney, J., Mike, W., & Ketchen, J. (2001). The resource-based view of the firm: Ten years after 1991. *Journal of Management*, *27*(6), 625–641. doi:10.1177/014920630102700601

Baron, R. M., & Kenny, D. a. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182. doi:10.1037//0022-3514.51.6.1173

Basterretxea, I., & Martinez, R. (2012). Impact of Management and Innovation Capabilities on Performance: Are Cooperative Different? *Annals of Public and Cooperative Economics 83:3*, *83*, 357–381.

Batal, Alrawy, & A. (2011). The Role of Private Banks In Financing Small and Medium Enterprises in. *AL-Anbar University Journal of Economic and Administration Sciences*, *4*(7), 44–68. Retrieved from http://www.iasj.net/iasj

Bear, M., & Frese, M. (2003). Innovation is not enough : climates for initiative and psychological safety , process innovations , and firm performance. *Journal of Organizational Behavior*, *24*(1), 45–68. doi:10.1002/job.Published

Beck, L., Janssens, W., Debruyne, M., & Lommelen, T. (2011). A Study of the Relationships Between Generation, Market Orientation, and Innovation in Family Firms. *Family Business Review*, *24*(3), 252–272. doi:10.1177/0894486511409210

Bhamra, R., Dani, S., & Bhamra, T. (2011). Competence understanding and use in SMEs: a UK manufacturing perspective. *International Journal of Production Research*, *49*(10), 2729–2743. doi:10.1080/00207541003738873

Bhuian, S. N., Menguc, B., & Bell, S. J. (2005). Just entrepreneurial enough: the moderating effect of entrepreneurship on the relationship between market orientation and performance. *Journal of Business Research*, *58*(1), 9–17. doi:10.1016/S0148-2963(03)00074-2

Bigliardi, B., & Dormio, A. I. (2009). An empirical investigation of innovation determinants in food machinery enterprises. *European Journal of Innovation Management*, *12*(2), 223–242. doi:10.1108/14601060910953988

Blesa, A., & Ripolles, M. (2003). The Role of Market Orientation in the Relationship between Entrepreneurial Proactiveness and Performance. *Journal of Entrepreneurship*, *12*(1), 1–19. doi:10.1177/097135570301200101

Boguslauskas, V., & Kvedaraviciene, G. (2009). Difficulties in identifying Company ' s Core Competencies and Core Processes. *Commerce of Engineering Decisions*, *2*(1), 75–82.

Börjesson, S., Elmquist, M., & Hooge, S. (2014). The challenges of innovation capability building: Learning from longitudinal studies of innovation efforts at Renault and Volvo Cars. *Journal of Engineering and Technology Management*, *31*, 120–140. doi:10.1016/j.jengtecman.2013.11.005

Boso, N., Cadogan, J. W., & Story, V. M. (2012a). Complementary effect of entrepreneurial and market orientations on export new product success under differing levels of competitive intensity and financial capital. *International Business Review*, *21*(4), 667–681. doi:10.1016/j.ibusrev.2011.07.009

Boso, N., Cadogan, J. W., & Story, V. M. (2012b). Entrepreneurial orientation and market orientation as drivers of product innovation success: A study of exporters from a developing economy. *International Small Business Journal*, *31*(1), 57–81. doi:10.1177/0266242611400469

Bouncken, R. B., & Kraus, S. (2013). Innovation in knowledge-intensive industries: The double-edged sword of coopetition. *Journal of Business Research*, *66*(10), 2060–2070. doi:10.1016/j.jbusres.2013.02.032

Bowen, S. (2011). *October 30, 2011 Quarterly Report to Congress*. Arlington. Retrieved from http://www.sigir.mil/

Bowen, S. (2012). *April 2012 Quarterly Report to Congress*. Arlington. Retrieved from http://www.sigir.mil/

Branzei, O., & Vertinsky, I. (2006). Strategic pathways to product innovation capabilities in SMEs. *Journal of Business Venturing*, *21*(1), 75–105. doi:10.1016/j.jbusvent.2004.10.002

Bryman, A., & Bell, E. (2011). *Business Research Methods* (Third Edit.). New York: Oxford University Press.

Byrne, B. M. (2010). *Structural Equation Modeling with AMOS Basic Concepts, Applications, and Programming* (Second Edi.). USA: Taylor & Francis Group.

Caccia-Bava, M. D. C., Guimaraes, T., & Harrington, S. J. (2006). Hospital organization

culture, capacity to innovate and success in technology adoption. *Journal of Health Organisation and Management*, *20*(3), 194–217. doi:10.1108/14777260610662735

Cambra-Fierro, J. J., Hart, S., Polo-Redondo, Y., & Fuster-Mur, A. (2011). Market and learning orientation in times of turbulence: relevance questioned? An analysis using a multi-case study. *Quality & Quantity*, *46*(3), 855–871. doi:10.1007/s11135-011-9429-x

Camelo, C., Fernández-Alles, M., & Hernández, A. B. (2010). Strategic consensus, top management teams, and innovation performance. *International Journal of Manpower*, *31*(6), 678–695. doi:10.1108/01437721011073373

Camisón, C., & Forés, B. (2010). Knowledge absorptive capacity: New insights for its conceptualization and measurement. *Journal of Business Research*, *63*(7), 707–715. doi:10.1016/j.jbusres.2009.04.022

Camisón, C., & Villar-López, A. (2012a). On How Firms Located in an Industrial District Profit from Knowledge Spillovers: Adoption of an Organic Structure and Innovation Capabilities. *British Journal of Management*, *23*, no–no. doi:10.1111/j.1467-8551.2011.00745.x

Camisón, C., & Villar-López, A. (2012b). Organizational innovation as an enabler of technological innovation capabilities and firm performance. *Journal of Business Research*, *67*(1), 2891–2902. doi:10.1016/j.jbusres.2012.06.004

Carbonell, P., & Escudero, A. I. R. (2010). The effect of market orientation on innovation speed and new product performance. *Journal of Business & Industrial Marketing*, *25*(7), 501–513. doi:10.1108/08858621011077736

Carmen, C., & José, G. M. (2008). The role of technological and organizational innovation

in the relation between market orientation and performance in cultural organizations. *European Journal of Innovation Management*, *11*(3), 413–434. doi:10.1108/14601060810889035

Celuch, K., & Murphy, G. (2010). SME Internet use and strategic flexibility: the moderating effect of IT market orientation. *Journal of Marketing Management*, *26*(1-2), 131–145. doi:10.1080/02672570903574296

Cervera, A., Molla, A., & Sanchez, M. (2001). Antecedents and consequences of market orientation in public organisations. *European Journal of Marketing*, *35*(11), 1259–1286.

Cha, E.-S., Kim, K. H., & Erlen, J. a. (2007). Translation of scales in cross-cultural research: issues and techniques. *Journal of Advanced Nursing*, *58*(4), 386–95. doi:10.1111/j.1365-2648.2007.04242.x

Chalmers, D. M., & Balan-Vnuk, E. (2012). Innovating not-for-profit social ventures: Exploring the microfoundations of internal and external absorptive capacity routines. *International Small Business Journal*, *31*(7), 785–810. doi:10.1177/0266242612465630

Chang, S., Gong, Y., Way, S. a., & Jia, L. (2013). Flexibility-Oriented HRM Systems, Absorptive Capacity, and Market Responsiveness and Firm Innovativeness. *Journal of Management*, *39*(7), 1924–1951. doi:10.1177/0149206312466145

Chao, M. C.-H., & Spillan, J. E. (2010). The journey from market orientation to firm performance: A comparative study of US and Taiwanese SMEs. *Management Research Review*, *33*(5), 472–483. doi:10.1108/01409171011041901

Chen, J.-S., & Tsou, H.-T. (2012). Performance effects of IT capability, service process

innovation, and the mediating role of customer service. *Journal of Engineering and Technology Management*, *29*(1), 71–94. doi:10.1016/j.jengtecman.2011.09.007

Chen, Y. (2012). Risk in integrated leapfrogging mode of technological innovation. *Kybernetes*, *41*(10), 1423–1439. doi:10.1108/03684921211276657

Cheng, & Chen, J.-S. (2013). Breakthrough innovation: the roles of dynamic innovation capabilities and open innovation activities. *Journal of Business & Industrial Marketing*, *28*(5), 444–454. doi:10.1108/08858621311330281

Cheng, C.-F., Chang, M.-L., & Li, C.-S. (2012). Configural paths to successful product innovation. *Journal of Business Research*. doi:10.1016/j.jbusres.2012.10.006

Chung, H. F. L. (2012). Export market orientation, managerial ties, and performance. *International Marketing Review*, *29*(4), 403–423. doi:10.1108/02651331211242638

CIPE. (2007). *Kurdistan Business Agenda*. *Kurdistan Business Agenda* (Vol. 28). Washington DC. doi:10.1093/her/cyt035

Clardy, a. (2008). Human Resource Development and the Resource-Based Model of Core Competencies: Methods for Diagnosis and Assessment. *Human Resource Development Review*, *7*(4), 387–407. doi:10.1177/1534484308324144

Clark, L., & Watson, D. (1995). Constructing Validity: Basic Issues in Objective Scale Development. *The American Psychological Association*, *7*(3), 309–319. doi:10.1037/1040-3590.7.3.309

Classen, Gils, Bammens, & Carree. (2012). The Search Breadth of Family SMEs. *Journal of Small Business Management*, *50*(2), 191–215.

Cochran, W. G. (1977). *Sampling Techniques* (Third Edit., Vol. 76). USA: John Wiley & Sons.

Cohen, Manion, L., & Morrison, K. (2007). *Research Methods in Education* (Sixth Edit.). UK: Routledge Taylor & Francis Group.

Cohen, W., & Levinthal, D. (1990). Absorptive Capacity : A New Perspective on Learning and Innovation Wesley M . Cohen ; Daniel A . Levinthal Absorptive Capacity : A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, *35*(1), 128–152. doi:0001-8392/90/3501-0128/$1.OO

Cooper, & Schindler, P. (2014). *Business Research Methods* (Twelfth Ed.). New York City: McGraw-Hill Education.

Cooper, R. G. (1994). New Products: The Factors that Drive Success. *International Marketing Review*, *11*(1), 60–76. doi:10.1108/02651339410057527

Costică, M. B. (2013). Harmonization process in defining small and medium-sized enterprises . Arguments for a quantitative definition versus a qualitative one. *Theoretical and Applied Economics*, *20*(9), 103–114.

Covin, J. G., & Miller, D. (2014). International Entrepreneurial Orientation: Conceptual Considerations, Research Themes, Measurement Issues, and Future Research Directions. *Entrepreneurship Theory and Practice*, *38*(1), 11–44. doi:10.1111/etap.12027

Covin, J. G., & Wales, W. J. (2012). The Measurement of Entrepreneurial Orientation. *Entrepreneurship Theory and Practice*, *36*(4), 677–702. doi:10.1111/j.1540-6520.2010.00432.x

Creswell, J. W. (2009). *Research Design Qualitative, Quantitative, and Mixed Methods approaches* (Third Edit.). USA: Sage Publications, Inc.

Crossan, M. M., & Apaydin, M. (2010). A Multi-Dimensional Framework of

Organizational Innovation: A Systematic Review of the Literature. *Journal of Management Studies*, *47*(6), 1154–1191. doi:10.1111/j.1467-6486.2009.00880.x

Damanpour, F. (1991). Organizational Innovation: A Meta-Analysis of Effects of Determinants and Moderators. *Academy of Management Journal*, *34*(3), 555–590. doi:10.2307/256406

Danneels, E. (2002). The dynamics of product innovation and firm competences. *Strategic Management Journal*, *23*(12), 1095–1121. doi:10.1002/smj.275

Delmas, M., Hoffmann, V. H., & Kuss, M. (2011). Under the Tip of the Iceberg: Absorptive Capacity, Environmental Strategy, and Competitive Advantage. *Business & Society*, *50*(1), 116–154. doi:10.1177/0007650310394400

Deng, P. (2010). Absorptive capacity and a failed cross-border M&A. *Management Research Review*, *33*(7), 673–682. doi:10.1108/01409171011055771

Dhewanto, W., Prasetio, E. A., Ratnaningtyas, S., Herliana, S., Chaerudin, R., Aina, Q., … Rachmawaty, E. (2012). Moderating Effect of Cluster on Firm's Innovation Capability and Business Performance: A Conceptual Framework. *Procedia - Social and Behavioral Sciences*, *65*(ICIBSoS), 867–872. doi:10.1016/j.sbspro.2012.11.212

Diaz-Pichardo, R., Cantu-Gonzalez, C., Lopez-Hernandez, P., & McElwee, G. (2012). From Farmers to Entrepreneurs: The Importance of Collaborative Behaviour. *Journal of Entrepreneurship*, *21*(1), 91–116. doi:10.1177/097135571102100104

Drucker, P. (2002). The Discipline of Innovation. *Harvard Business Review*, *August*, 95–102.

Easterby-Smith, M., & Prieto, I. M. (2008). Dynamic Capabilities and Knowledge Management: an Integrative Role for Learning? *. *British Journal of Management*,

19(3), 235–249. doi:10.1111/j.1467-8551.2007.00543.x

Eisenman, M. (2013). Understanding Aesthetic Innovation in The Context of Technological Evolution. *Academy of Management Review*, *38*(3), 332–351. Retrieved from http://dx.doi.org/10.5465/amr.2011.0262

Eris, E. D., & Ozmen, T. O. (2012). The Effect of Market Orientation , Learning Orientation and Innovativeness on Firm Performance : A Research from Turkish Logistics Sector. *International Journal of Economic Sciences and Applied Research*, *5*(1), 77–108.

Ettlie, J. E., & Reza, E. M. (1992). Organizational Integration and Process Innovation. *Academy of Management Journal*, *35*(4), 795–827.

Feghali, T., & El-Den, J. (2008). Knowledge transformation among virtually-cooperating group members. *Journal of Knowledge Management*, *12*(1), 92–105. doi:10.1108/13673270810852412

Ferraresi, A. a., Quandt, C., Santos, S., & Frega, J. (2012). Knowledge management and strategic orientation: leveraging innovativeness and performance. *Journal of Knowledge Management*, *16*(5), 688–701. doi:10.1108/13673271211262754

Flatten, Engelen, A., Zahra, S. a., & Brettel, M. (2011). A measure of absorptive capacity: Scale development and validation. *European Management Journal*, *29*(2), 98–116. doi:10.1016/j.emj.2010.11.002

Flatten, T., Greve, G., & Brettel, M. (2011). Absorptive Capacity and Firm Performance in SMEs: The Mediating Influence of Strategic Alliances. *European Management Review*, *8*(3), 137–152. doi:10.1111/j.1740-4762.2011.01015.x

Fleming, J. . (1985). An Index of Fit for Factor Scales. *Educational and Psychological*

Measurement, *45*(1), 725–728.

Fletcher, M., & Prashantham, S. (2011). Knowledge assimilation processes of rapidly internationalising firms: Longitudinal case studies of Scottish SMEs. *Journal of Small Business and Enterprise Development*, *18*(3), 475–501. doi:10.1108/14626001111155673

Flores, L. G., Zheng, W., Rau, D., & Thomas, C. H. (2010). Organizational Learning: Subprocess Identification, Construct Validation, and an Empirical Test of Cultural Antecedents. *Journal of Management*, *38*(2), 640–667. doi:10.1177/0149206310384631

Foerstl, K., & Kirchoff, J. F. (2016). The role of absorptive and desorptive capacity in sustainable supply management – A longitudinal analysis. *International Journal of Physical Distribution & Logistics Management*, *46*(2), 1–51. doi:10.1108/IJPDLM-05-2015-0138

Foley, A., & Fahy, J. (2009). Seeing market orientation through a capabilities lens. *European Journal of Marketing*, *43*(1/2), 13–20. doi:10.1108/03090560910923201

Fornell, C., & Larcker, F. (1981). Structural Equation Models With Unobservable Variables and Measurement Error : Algebra and Statistics. *Journal of Marketing Research*, *XVIII*(August), 382–389.

Foss, N. J., & Ishikawa, I. (2007). Towards a Dynamic Resource-based View: Insights from Austrian Capital and Entrepreneurship Theory. *Organization Studies*, *28*(5), 749–772. doi:10.1177/0170840607072546

Galbreath, J. (2005). Which resources matter the most to firm success? An exploratory study of resource-based theory. *Technovation*, *25*(9), 979–987.

doi:10.1016/j.technovation.2004.02.008

Gallego, J., Rubalcaba, L., & Hipp, C. (2012). Organizational innovation in small European firms: A multidimensional approach. *International Small Business Journal*, *31*(5), 563–579. doi:10.1177/0266242611430100

Gallié, E.-P., & Legros, D. (2011). Firms' human capital, R&D and innovation: a study on French firms. *Empirical Economics*, *43*(2), 581–596. doi:10.1007/s00181-011-0506-8

García-Morales, V. J., Bolívar-Ramos, M. T., & Martín-Rojas, R. (2013). Technological variables and absorptive capacity's influence on performance through corporate entrepreneurship. *Journal of Business Research*. doi:10.1016/j.jbusres.2013.07.019

Gaur, S. S., Vasudevan, H., & Gaur, A. S. (2011). Market orientation and manufacturing performance of Indian SMEs: Moderating role of firm resources and environmental factors. *European Journal of Marketing*, *45*(7/8), 1172–1193. doi:10.1108/03090561111137660

Gebauer, H., Worch, H., & Truffer, B. (2012). Absorptive capacity, learning processes and combinative capabilities as determinants of strategic innovation. *European Management Journal*, *30*(1), 57–73. doi:10.1016/j.emj.2011.10.004

Goktan, a. B., & Miles, G. (2011). Innovation speed and radicalness: are they inversely related? *Management Decision*, *49*(4), 533–547. doi:10.1108/00251741111126477

González-Benito, Ó., González-Benito, J., & Muñoz-Gallego, P. a. (2009). Role of entrepreneurship and market orientation in firms' success. *European Journal of Marketing*, *43*(3/4), 500–522. doi:10.1108/03090560910935550

González-Loureiro, M., & Pita-Castelo, J. (2013). A model for assessing the contribution of innovative SMEs to economic growth: The intangible approach. *Economics Letters*,

116(3), 312–315. doi:10.1016/j.econlet.2012.03.028

Gray, C. (2006). Absorptive capacity, knowledge management and innovation in entrepreneurial small firms. *International Journal of Entrepreneurial Behaviour & Research*, *12*(6), 345–360. doi:10.1108/13552550610710144

Grinstein, A. (2008a). The effect of market orientation and its components on innovation consequences: a meta-analysis. *Journal of the Academy of Marketing Science*, *36*(2), 166–173. doi:10.1007/s11747-007-0053-1

Grinstein, A. (2008b). The relationships between market orientation and alternative strategic orientations: A meta-analysis. *European Journal of Marketing*, *42*(1/2), 115–134. doi:10.1108/03090560810840934

Guan, J. C., Yam, R. C. M., Mok, C. K., & Ma, N. (2006). A study of the relationship between competitiveness and technological innovation capability based on DEA models. *European Journal of Operational Research*, *170*(3), 971–986. doi:10.1016/j.ejor.2004.07.054

Guo, Zhao, J., & Tang, J. (2013). The role of top managers' human and social capital in business model innovation. *Chinese Management Studies*, *7*(3), 447–469. doi:10.1108/CMS-03-2013-0050

Guo, T., & Shi, Z. (2012). Systematic Analysis on the Environment of Innovative Small and Medium Enterprises. *Physics Procedia*, *24*, 1214–1220. doi:10.1016/j.phpro.2012.02.181

Hair, Hult, G., Ringle, C., & Sarstedt, M. (2014). *A Primer on Partial Least Squares Structural Equation Modeling*. *Long Range Planning* (First edit., Vol. 46). Singapore: Sage.

Hair, Ringle, C., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *The Journal of Marketing Theory and Practice*, *19*(2), 139–152. doi:10.2753/MTP1069-6679190202

Hair, Sarstedt, M., Ringle, M. M., & Mena, J. A. (2011). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, *40*(3), 414–433. doi:10.1007/s11747-011-0261-6

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis* (Seventh Ed.). USA: Prentice Hall.

Hall, R., & Andriani, P. (2003). Managing knowledge associated with innovation. *Journal of Business Research*, *56*(2), 145–152. doi:10.1016/S0148-2963(01)00287-9

Han, Z., & Erming, X. (2012). Knowledge assimilation and exploitation: Comparison in corporations with different ownership identity. *Nankai Business Review International*, *3*(1), 31–51. doi:10.1108/20408741211201908

Henard, D. H., & Szymanski, D. M. (2001). Why Some New Products Are More Successful Than Others. *Journal of Marketing Research*, *37*(August), 362–75. doi:org/10.1509/jmkr.38.3.362.18861

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*, 115–135. doi:10.1007/s11747-014-0403-8

Herath, H., & Mahmood, R. (2013). Strategic Orientation Based Research Model of SME Performance for Developing Countries. *Rev. Integr. Bus. Econ. Res*, *2*(1), 430–446.

Hodgkinson, I. R., Hughes, P., & Hughes, M. (2012). Absorptive capacity and market orientation in public service provision. *Journal of Strategic Marketing*, *20*(3), 211–229. doi:10.1080/0965254X.2011.643915

Hollen, R. M. a., Van Den Bosch, F. a. J., & Volberda, H. W. (2013). The Role of Management Innovation in Enabling Technological Process Innovation: An Inter-Organizational Perspective. *European Management Review*, *10*(1), 35–50. doi:10.1111/emre.12003

Hong, J., Song, T. H., & Yoo, S. (2013). Paths to Success: How Do Market Orientation and Entrepreneurship Orientation Produce New Product Success? *Journal of Product Innovation Management*, *30*(1), 44–55. doi:10.1111/j.1540-5885.2012.00985.x

Huang, & Wang, Y.-L. (2011). Entrepreneurial orientation, learning orientation, and innovation in small and medium enterprises. *Procedia - Social and Behavioral Sciences*, *24*, 563–570. doi:10.1016/j.sbspro.2011.09.004

Huang, H.-C., Lai, M.-C., & Lin, T.-H. (2011). Aligning intangible assets to innovation in biopharmaceutical industry. *Expert Systems with Applications*, *38*(4), 3827–3834. doi:10.1016/j.eswa.2010.09.043

Huang, J.-W., & Li, Y.-H. (2009). The mediating effect of knowledge management on social interaction and innovation performance. *International Journal of Manpower*, *30*(3), 285–301. doi:10.1108/01437720910956772

Hughes, M., Hughes, P., & Morgan, R. E. (2007). Exploitative Learning and Entrepreneurial Orientation Alignment in Emerging Young Firms: Implications for Market and Response Performance. *British Journal of Management*, *18*(4), 359–375. doi:10.1111/j.1467-8551.2007.00519.x

Hughes, P., Morgan, R. E., & Kouropalatis, Y. (2008). Market knowledge diffusion and business performance. *European Journal of Marketing*, *42*(11/12), 1372–1395. doi:10.1108/03090560810903718

Hult, G. T. M., & Ketchen, D. J. (2001). Does market orientation matter?: a test of the relationship between positional advantage and performance. *Strategic Management Journal*, *22*(9), 899–906. doi:10.1002/smj.197

Hung, R. Y.-Y., Lien, B. Y.-H., Fang, S.-C., & McLean, G. N. (2010). Knowledge as a facilitator for enhancing innovation performance through total quality management. *Total Quality Management & Business Excellence*, *21*(4), 425–438. doi:10.1080/14783361003606795

Hunt, S. D., & Morgan, R. M. (1995). The Comparative Advantage Theory of Competition. *Journal of Marketing*, *59*(April), 1–15.

Hurley, F. R., & Hult, G. M. (1998). innovation, market orientation, and Organizational Learning: An Integration and Empirical Examination.pdf. *Journal of Marketing*, *62*(July), 42–54.

Hurmelinna-Laukkanen, P. (2012). Constituents and outcomes of absorptive capacity – appropriability regime changing the game. *Management Decision*, *50*(7), 1178–1199. doi:10.1108/00251741211246950

IFC. (2011). *Iraq Counrty Profile-Enterprise Surveys*. Danvers. Retrieved from http://www.enterprisesurveys.org

Iii, P. E. B., Damanpour, F., & Santoro, M. D. (2009). The Application of External Knowledge : Organizational Conditions for Exploration and Exploitation. *Journal of Management Studies*, *46*(May), 481–509. doi:10.1111/j.1467-6486.2009.00829.x

Inauen, M., & Schenker-Wicki, A. (2011). The impact of outside-in open innovation on innovation performance. *European Journal of Innovation Management*, *14*(4), 496–520. doi:10.1108/14601061111174934

Ishak, A. K. (2012). *Personality, Occupational Stress and Wellness among Prison officers: The Mediating Role of self effecacy and Perceived Fairness*. (Unpublished doctoral thesis). University Utara Malaysia.

Jantunen, A. (2005). Knowledge-processing capabilities and innovative performance: an empirical study. *European Journal of Innovation Management*, *8*(3), 336–349. doi:10.1108/14601060510610199

Javalgi, R. G., Hall, K. D., & Cavusgil, S. T. (2014). Corporate entrepreneurship, customer-oriented selling, absorptive capacity, and international sales performance in the international B2B setting: Conceptual framework and research propositions. *International Business Review*, *23*(6), 1193–1202. doi:10.1016/j.ibusrev.2014.04.003

Jaworski, B., Kohli, A., & Sahay, a. (2000). Market-Driven Versus Driving Market. *Journal of the Academy of Marketing Science*, *28*(1), 45–54.

Jiménez-Jiménez, D., & Valle, R. S. (2011). Innovation, organizational learning, and performance. *Journal of Business Research*, *64*(4), 408–417. doi:10.1016/j.jbusres.2010.09.010

Jiménez-Jimenez, D., Valle, R. S., & Hernandez-Espallardo, M. (2008). Fostering innovation: The role of market orientation and organizational learning. *European Journal of Innovation Management*, *11*(3), 389–412. doi:10.1108/14601060810889026

Johannessen, J.-A., & Olsen, B. (2011). What creates innovation in a globalized knowledge economy? A cybernetic point of view. *Kybernetes*, *40*(9/10), 1395–1421. doi:10.1108/03684921111169459

Jones, R., & Rowley, J. (2011). Entrepreneurial marketing in small businesses: A

conceptual exploration. *International Small Business Journal*, *29*(1), 25–36. doi:10.1177/0266242610369743

Jung-Erceg, P., Pandza, K., Armbruster, H., & Dreher, C. (2007). Absorptive capacity in European manufacturing: a Delphi study. *Industrial Management & Data Systems*, *107*(1), 37–51. doi:10.1108/02635570710719043

Kamal, E. M., & Flanagan, R. (2012). Understanding absorptive capacity in Malaysian small and medium sized (SME) construction companies. *Journal of Engineering, Design and Technology*, *10*(2), 180–198. doi:10.1108/17260531211241176

Kamasak, R., & Bulutlar, F. (2010). The influence of knowledge sharing on innovation. *European Business Review*, *22*(3), 306–317. doi:10.1108/09555341011040994

Keh, H. T., Nguyen, T. T. M., & Ng, H. P. (2007). The effects of entrepreneurial orientation and marketing information on the performance of SMEs. *Journal of Business Venturing*, *22*(4), 592–611. doi:10.1016/j.jbusvent.2006.05.003

Ketchen, J., Hult, G. m., & Slater, S. F. (2007). Research Notes and Commentaries Toward Greater Understanding of Market Orientation and The Resource-Based Theory. *Strategic Management Journal*, *28*(April), 961–964. doi:10.1002/smj

KFCCI. (2012). Kurdistan Region Companies Directory. Iraq Erbil: Kurdistan Federation Chamber of commerce and Industry/ Iraq.

Kim, Lee, B., & Oh, K. (2009). The effect of R&D and technology commercialization capabilities on the innovation performance of Korean it SMEs: The case of direct and indirect recipients of public R&D funding. In *PICMET '09 - 2009 Portland International Conference on Management of Engineering & Technology* (pp. 1531–1541). Ieee. doi:10.1109/PICMET.2009.5261985

Kim, Zhan, W., & Erramilli, M. K. (2011). Resources and performance of international joint ventures: the moderating role of absorptive capacity. *Journal of Asia Business Studies*, *5*(2), 145–160. doi:10.1108/15587891111152311

Kim, N., Im, S., & Slater, S. F. (2013). Impact of Knowledge Type and Strategic Orientation on New Product Creativity and Advantage in High-Technology Firms. *Journal of Product Innovation Management*, *30*(1), 136–153. doi:10.1111/j.1540-5885.2012.00992.x

Klomp, J. (2011). The measurement of human capital: a multivariate macro-approach. *Quality & Quantity*, *47*(1), 121–136. doi:10.1007/s11135-011-9507-0

Knoppen, D., Saenz, M. J., & Johnston, D. a. (2011). Innovations in a relational context: Mechanisms to connect learning processes of absorptive capacity. *Management Learning*, *42*(4), 419–438. doi:10.1177/1350507610389684

Ko, H.-T., & Lu, H.-P. (2010). Measuring innovation competencies for integrated services in the communications industry. *Journal of Service Management*, *21*(2), 162–190. doi:10.1108/09564231011039277

Kohli, A. K., & Jaworski, B. J. (1990). Market Orientation : The Construct, research Proposition, and Managerial Implications. *Journal of Marketing*, *54*(April), 1–18.

Kohli, A. K., & Jaworski, B. J. (1993). Market Orientation: Antecedents and Consequences. *Journal of Marketing*, *57*(July), 53–70. Retrieved from http://www.jstor.org/stable/1251854

Kohli, A. K., Jaworski, B. J., & Kumar, A. (1993). MARKOR : A Measure of Market Orientation. *Journal of Marketing Research*, *30*(November), 467–478. Retrieved from http://www.jstor.org/stable/3172691

Kostopoulos, K., Papalexandris, A., Papachroni, M., & Ioannou, G. (2011). Absorptive capacity, innovation, and financial performance. *Journal of Business Research*, *64*(12), 1335–1343. doi:10.1016/j.jbusres.2010.12.005

Kotabe, M., Jiang, C. X., & Murray, J. Y. (2011). Managerial ties, knowledge acquisition, realized absorptive capacity and new product market performance of emerging multinational companies: A case of China. *Journal of World Business*, *46*(2), 166–176. doi:10.1016/j.jwb.2010.05.005

Kothari, C. R. (2004). *Research Methodology: Methods and techniques* (First Edit.). New Delhi: New Age International.

Krejcie, R. V, & Morgan, D. W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement*, *38*, 607–610.

Kristensson, P., Gustafsson, A., & Witell, L. (2011). Collaboration with Customers - Understanding the Effect of Customer-Company Interaction in New Product Development. In *2011 44th Hawaii International Conference on System Sciences* (pp. 1–9). Ieee. doi:10.1109/HICSS.2011.110

Kropp, F., Lindsay, N. J., & Shoham, A. (2006). Entrepreneurial, market, and learning orientations and international entrepreneurial business venture performance in South African firms. *International Marketing Review*, *23*(5), 504–523. doi:10.1108/02651330610703427

Laforet, S. (2011). A framework of organisational innovation and outcomes in SMEs. *International Journal of Entrepreneurial Behaviour & Research*, *17*(4), 380–408. doi:10.1108/13552551111139638

Lall, S. (1992). Technological capabilities and industrialization. *World Development*, *20*(2),

165–186. doi:10.1016/0305-750X(92)90097-F

Lau, A. K. W., Yam, R. C. M., & Tang, E. P. Y. (2010). The impact of technological innovation capabilities on innovation performance: An empirical study in Hong Kong. *Journal of Science and Technology Policy in China*, *1*(2), 163–186. doi:10.1108/17585521011059893

Lavie, D. (2006). The Competitive advantage of Interconnected Firms: An Extension of The Resource-Based View. *Academy of Management Review*, *31*(3), 638–658.

Lawson, B., & Samson, D. (2001). Developing Innovation Capability in Organisations: a Dynamic Capabilities Approach. *International Journal of Innovation Management*, *05*(03), 377–400. doi:10.1142/S1363919601000427

Lee, Leong, L.-Y., Hew, T.-S., & Ooi, K.-B. (2013). Knowledge management: a key determinant in advancing technological innovation? *Journal of Knowledge Management*, *17*(6), 848–872. doi:10.1108/JKM-08-2013-0315

Lee, T.-S., & Tsai, H.-J. (2005). The effects of business operation mode on market orientation, learning orientation and innovativeness. *Industrial Management & Data Systems*, *105*(3), 325–348. doi:10.1108/02635570510590147

Lertwongsatien, & Ravichandran. (2005). Effect of Information Systems Resources and Capabilities on Firm Performance : A Resource-Based Perspective. *Journal of Management Information System*, *21*(4), 237–276.

Li. (2011). Sources of External Technology, Absorptive Capacity, and Innovation Capability in Chinese State-Owned High-Tech Enterprises. *World Development*, *39*(7), 1240–1248. doi:10.1016/j.worlddev.2010.05.011

Li, Wei, Z., & Liu, Y. (2010). Strategic Orientations, Knowledge Acquisition, and Firm

Performance: The Perspective of the Vendor in Cross-Border Outsourcing. *Journal of Management Studies*, *47*(8), 1457–1482. doi:10.1111/j.1467-6486.2010.00949.x

Li, Y., Zhao, Y., Tan, J., & Liu, Y. (2008). Moderating Effects of Entrepreneurial Orientation on Market Orientation-Performance Linkage: Evidence from Chinese Small Firms. *Journal of Small Business Management*, *46*(1), 113–133. doi:10.1111/j.1540-627X.2007.00235.x

Liao, Fei, W.-C., & Chen, C.-C. (2007). Knowledge sharing, absorptive capacity, and innovation capability: an empirical study of Taiwan's knowledge-intensive industries. *Journal of Information Science*, *33*(3), 340–359. doi:10.1177/0165551506070739

Liao, Welsch, H., & Stoica, M. (2003a). Organizational Absorptive Capacity and Responsiveness : An Empirical Investigation of Growth-Oriented SMEs. *ET&P*, *Fall*, 63–86.

Liao, Welsch, H., & Stoica, M. (2003b). Organizational Absorptive Capacity and Responsiveness: An Empirical Investigation of Growth-Oriented SMEs. *Entrepreneurship Theory and Practice*, *28*(1), 63–85. doi:10.1111/1540-8520.00032

Liao, Wu, C. -c., Hu, D. -c., & Tsui, K. -a. (2010). Relationships between knowledge acquisition, absorptive capacity and innovation capability: an empirical study on Taiwan's financial and manufacturing industries. *Journal of Information Science*, *36*(1), 19–35. doi:10.1177/0165551509340362

Liao, C., & Chechen, S. (2006). Exploring the Role of Knowledge Management for Enhancing Firm ' s Innovation and Performance. In *Proceedings of the 39th Hawaii International Conference on System Sciences* (Vol. 00, pp. 1–10).

Lin, Peng, C., & Kao, D. (2008). The innovativeness effect of market orientation and

learning orientation on business performance. *International Journal of Manpower*, *29*(8), 752–772. doi:10.1108/01437720810919332

Lin, Y., & Wu, L.-Y. (2013). Exploring the role of dynamic capabilities in firm performance under the resource-based view framework. *Journal of Business Research*, *20*(20), 1–7. doi:10.1016/j.jbusres.2012.12.019

Lings, I. N., & Greenley, G. E. (2010). Internal market orientation and market-oriented behaviours. *Journal of Service Management*, *21*(3), 321–343. doi:10.1108/09564231011050788

Liu, X. (2010). Can international acquisition be an effective way to boost innovation in developing countries?: Evidences from China's TFT-LCD industry. *Journal of Science and Technology Policy in China*, *1*(2), 116–134. doi:10.1108/17585521011059866

Loi, R., Lam, L. W., Ngo, H. Y., & Cheong, S. (2013). Flying High, Landing Soft": An innovative entrepreneurial curriculum for Chinese SMEs going abroad. *Journal of Chinese Entrepreneurship*, *5*(1), pp. 645–658. doi:http://dx.doi.org/10.1108/02683940010305270

Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the Entrepreneurial Orientation Construct and Linking It to Performance. *The Academy of Management Review*, *21*(1), 135. doi:10.2307/258632

Luo, X., Zhou, L., & Liu, S. S. (2005). Entrepreneurial firms in the context of China's transition economy: an integrative framework and empirical examination. *Journal of Business Research*, *58*(3), 277–284. doi:10.1016/S0148-2963(03)00159-0

MacKinnon, D., & Fairchild, A. (2010). Current Directions in Mediation Analysis. *Curr*

Dir Psychol Sci, *18*(1), 16–20. doi:10.1111/j.1467-8721.2009.01598.x.Current

Mahmood, R., & Hanafi, N. (2013). Entrepreneurial Orientation and Business Performance of Women-Owned Small and Medium Enterprises in Malaysia : Competitive Advantage as a Mediator. *International Journal of Business and Social Science*, *4*(1), 82–90.

Malhotra, N. K., Lee, O. F., & Uslay, C. (2012). Mind the gap: The mediating role of mindful marketing between market and quality orientations, their interaction, and consequences. *International Journal of Quality & Reliability Management*, *29*(6), 607–625. doi:10.1108/02656711211245629

Marczyk, G., DeMatteo, D., & Festinger, D. (2005). *Essentials of Research Design and Methodology* (First Eedi.). New Jersey: John Wiley & Sons, Inc.

Martín-de Castro, G., Delgado-Verde, M., Navas-López, J. E., & Cruz-González, J. (2013). The moderating role of innovation culture in the relationship between knowledge assets and product innovation. *Technological Forecasting and Social Change*, *80*(2), 351–363. doi:10.1016/j.techfore.2012.08.012

Martinkenaite, I. (2012). Antecedents of knowledge transfer in acquisitions. *Baltic Journal of Management*, *7*(2), 167–184. doi:10.1108/17465261211219796

Martins, J. D. M. (2012). Analytical dimensions of knowledge transfer to the subsidiaries. *European Business Review*, *24*(5), 465–477. doi:10.1108/09555341211254535

Mason-Jones, R., & Towill, D. (2016). Open innovation in SMEs: a systematic literature review. *Int J Logistics Management*, *9*(1), 58–73.

Mathews, J. a. (2002). A resource-based view of Schumpeterian economic dynamics. *Journal of Evolutionary Economics*, *12*(1-2), 29–54. doi:10.1007/s00191-002-0106-z

Menguc, B., & Auh, S. (2010). Development and return on execution of product innovation capabilities: The role of organizational structure. *Industrial Marketing Management*, *39*(5), 820–831. doi:10.1016/j.indmarman.2009.08.004

Messersmith, J. G., & Wales, W. J. (2011). Entrepreneurial orientation and performance in young firms: The role of human resource management. *International Small Business Journal*, *31*(2), 115–136. doi:10.1177/0266242611416141

Messinis, G., & Ahmed, A. D. (2013). Cognitive skills, innovation and technology diffusion. *Economic Modelling*, *30*, 565–578. doi:10.1016/j.econmod.2012.10.002

Michailova, S., & Jormanainen, I. (2011). Knowledge transfer between Russian and Western firms: Whose absorptive capacity is in question? *Critical Perspectives on International Business*, *7*(3), 250–270. doi:10.1108/17422041111149525

Miczka, S., & Größler, A. (2010). Merger dynamics: Using system dynamics for the conceptual integration of a fragmented knowledge base. *Kybernetes*, *39*(9/10), 1491–1512. doi:10.1108/03684921011081132

Miller, D. (1983). The Correlation of Entrepreneurship in three Types of Firms. *Management Science*, *29*(7), 770–791. doi:org/10.1287/mnsc.29.7.770

Miller, D., & Friesen, P. H. (1982). Innovation in conservative and entrepreneurial firms: Two models of strategic momentum. *Strategic Management Journal*, *3*(1), 1–25. doi:10.1002/smj.4250030102

MOP. (2009). *The Republic of South Korea Courses From 2004 to the End of 2008 For the KRG employees*. Erbil.

Morris, M. H., Coombes, S., Schindehutte, M., & Allen, J. (2007). Antecedents and Outcomes of Entrepreneurial and Market Orientations in a Non-profit Context:

Theoretical and Empirical Insights. *Journal of Leadership & Organizational Studies*, *13*(4), 12–39. doi:10.1177/10717919070130040401

Mothe, C., & Thi, T. U. N. (2010). The link between non-technological innovations and technological innovation. *European Journal of Innovation Management*, *13*(3), 313–332. doi:10.1108/14601061011060148

MTIKRG. (2013). Industrial Factories Directory. Kurdistan Region of Iraq - Erbil: Ministry of Trade and Industry Kurdistan Region of Iraq.

Muller-Seitz, G., & Guttel, W. (2013). Toward a choreography of congregating: A practice-based perspective on organizational absorptive capacity in a semiconductor industry consortium. *Management Learning*, *0*(0). doi:10.1177/1350507613497323

Muscio, A. (2007). The Impact of absorptive Capacity on SMEs' Collaboration. *Economics of Innovation and New Technology*, *16*(8), 653–668. doi:10.1080/10438590600983994

Nagati, H., & Rebolledo, C. (2012). The role of relative absorptive capacity in improving suppliers' operational performance. *International Journal of Operations & Production Management*, *32*(5), 611–630. doi:10.1108/01443571211226515

Narvekar, R. S., & Jain, K. (2006). A new framework to understand the technological innovation process. *Journal of Intellectual Capital*, *7*(2), 174–186. doi:10.1108/14691930610661845

Narver, C. J., & Slater, F. S. (1990). The effect of Market Orientation on Business Profitability. *Journal of Marketing*, *54*(4), 20–35.

Nasution, H. N., & Mavondo, F. T. (2008). Organisational capabilities: antecedents and implications for customer value. *European Journal of Marketing*, *42*(3/4), 477–501.

doi:10.1108/03090560810853020

Neuman, W. L. (2007). *Basics of Social Research Qualitat ive and QuanftativeApproaches* (Second Edi.). USA: Pearson Education.

Newbert, S. L. (2007). Empirical Research on The Resource-Based View of The Firm: An assessment and Suggestion for Future Research. *Strategic Management Journal*, *28*, 121–146. doi:10.1002/smj

Newman, A., Prajogo, D., & Atherton, A. (2016). The influence of market orientation on innovation strategies. *Journal of Service Theory and Practice*, *26*(1), 72–90.

Ngo, L. V., & O'Cass, A. (2013). Innovation and business success: The mediating role of customer participation. *Journal of Business Research*, *66*(8), 1134–1142. doi:10.1016/j.jbusres.2012.03.009

Nonaka, I., Toyama, R., & Nagata, A. (2000). A New Perspective on the Theory of the. *Industrial and Corporate Changes*, *9*(1), 1–20. doi:10.1093/icc/9.1.1

O'Cass, a., & Sok, P. (2013). The role of intellectual resources, product innovation capability, reputational resources and marketing capability combinations in SME growth. *International Small Business Journal*. doi:10.1177/0266242613480225

O'Connor, G. C. (2008). Major Innovation as a Dynamic Capability: A System Approach. *Journal of Product Innovation Management*, *25*(Mi), 313–330. doi:10.1111/j.1540-5885.2008.00304.x

OECD. (2005). *Oslo manual*. Oslo. Retrieved from http://www.oecd.org/sti/inno/2367580.pdf

Olavarrieta, S., & Friedmann, R. (2008). Market orientation, knowledge-related resources and firm performance. *Journal of Business Research*, *61*(6), 623–630.

doi:10.1016/j.jbusres.2007.06.037

Ooi, K.-B., Lin, B., Teh, P.-L., & Chong, A. Y.-L. (2012). Does TQM support innovation performance in Malaysia's manufacturing industry? *Journal of Business Economics and Management*, *13*(2), 366–393. doi:10.3846/16111699.2011.620155

Otero-Neira, Arias, M. J. F., & Lindman, M. T. (2013). Market Orientation and Entrepreneurial Proclivity: Antecedents of Innovation. *Global Business Review*, *14*(3), 385–395. doi:10.1177/0972150913496719

Otero-Neira, C., Lindman, M. T., & Fernández, M. J. (2009). Innovation and performance in SME furniture industries: An international comparative case study. *Marketing Intelligence & Planning*, *27*(2), 216–232. doi:10.1108/02634500910944995

Park, T. and &, & Rhee, J. (2012). Antecedents of knowledge competency and performance in born globals: The moderating effects of absorptive capacity. *Management Decision*, *50*(8), 1361–1381. doi:10.1108/00251741211261971

Parrilli, M. D., & Elola, A. (2011). The strength of science and technology drivers for SME innovation. *Small Business Economics*, *39*(4), 897–907. doi:10.1007/s11187-011-9319-6

Perdomo-Ortiz, J., González-Benito, J., & Galende, J. (2009). The intervening effect of business innovation capability on the relationship between Total Quality Management and technological innovation. *International Journal of Production Research*, *47*(18), 5087–5107. doi:10.1080/00207540802070934

Pérez-Luño, A., Wiklund, J., & Cabrera, R. V. (2011). The dual nature of innovative activity: How entrepreneurial orientation influences innovation generation and adoption. *Journal of Business Venturing*, *26*(5), 555–571.

doi:10.1016/j.jbusvent.2010.03.001

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *The Journal of Applied Psychology*, *88*(5), 879–903. doi:10.1037/0021-9010.88.5.879

Polo Peña, A. I., Jamilena, D. M. F., & Molina, M. Á. R. (2012). Validation of a market orientation adoption scale in rural tourism enterprises. Relationship between the characteristics of the enterprise and extent of market orientation adoption. *International Journal of Hospitality Management*, *31*(1), 139–151. doi:10.1016/j.ijhm.2011.06.005

Prieto, I. M., & Revilla, E. (2006). Assessing the Impact of Learning Capability on Business Performance: Empirical Evidence from Spain. *Management Learning*, *37*(4), 499–522. doi:10.1177/1350507606070222

Pullen, A., de Weerd-Nederhof, P. C., Groen, A. J., & Fisscher, O. a. M. (2012). SME Network Characteristics vs. Product Innovativeness: How to Achieve High Innovation Performance. *Creativity and Innovation Management*, *21*(2), 130–146. doi:10.1111/j.1467-8691.2012.00638.x

Raju, P. S., Lonial, S. C., & Crum, M. D. (2011). Market orientation in the context of SMEs: A conceptual framework. *Journal of Business Research*, *64*(12), 1320–1326. doi:10.1016/j.jbusres.2010.12.002

Ramadani, V., & Gerguri, S. (2011). Innovations: principles and strategies. *Advances In Management*, *4*(7), 101–110. doi:10.1002/jsc.888

Ramayah, M., Hafeez, T., & Mohamad, A. (2016). The effect of market orientation as a

mediating variable in the relationship between entrepreneurial orientation and SMEs performance. *Nankai Business Review International Article Information*, *33*(2005), 233–246.

RAND. (2012). *Summary of Four Studies to Develop the Private Sector, Education, Health Care, and Data for Decisionmaking for the Kurdistan Region—Iraq*. Arlington. Retrieved from www.rand.org

RAND. (2014). *Strategies for Private-Sector Development and Civil-Service Reform in the Kurdistan Region—Iraq*. Arlington. Retrieved from www.rand.org

Ray, G., Barney, J. B., & Muhanna, W. a. (2004). Capabilities, business processes, and competitive advantage: choosing the dependent variable in empirical tests of the resource-based view. *Strategic Management Journal*, *25*(1), 23–37. doi:10.1002/smj.366

RDSKR. (2011). *Regional Development Strategy for Kurdistan Region report 2012-2016*. Erbil.

RDSKR. (2014). *Regional Development Strategy for Kurdistan Region 2015-2019*. Erbil.

Regmi, K., Jennie, N., & Paul, P. (2010). Understanding the Processes of Translation and Transliteration in Qualitative Research. *International Journal of Qualitative Methods*, *9*(1), 16–26.

Ren, R., & Yu, Z. (2016). Innovation-orientation, dynamic capabilities and evolution of the informal Shanzhai firms in China: a case study. *Journal of Entrepreneurship in Emerging Economies*, *8*(1), 1–12.

Renko, M., Alan, C., & Brännback, M. (2009). The Effect of a Market Orientation, Entrepreneurial Orientation, and Technological Capability on Innovativeness: A Study

of Young Biotechnology Ventures in the United States and in Scandinavia. *Journal of Small Business Management*, *47*(3), 331–369.

Ritter, T., & Gemünden, H. G. (2004). The impact of a company's business strategy on its technological competence, network competence and innovation success. *Journal of Business Research*, *57*(5), 548–556. doi:10.1016/S0148-2963(02)00320-X

Sandmeier, P., Morrison, P. D., & Gassmann, O. (2010). Integrating Customers in Product Innovation: Lessons from Industrial Development Contractors and In-House Contractors in Rapidly Changing Customer Markets. *Creativity and Innovation Management*, *19*(2), 89–106. doi:10.1111/j.1467-8691.2010.00555.x

Sarros, J. C., Cooper, B. K., & Santora, J. C. (2008). Building a Climate for Innovation Through Transformational Leadership and Organizational Culture. *Journal of Leadership & Organizational Studies*, *15*(2), 145–158. doi:10.1177/1548051808324100

Sarstedt, M., Ringle, C. M., Smith, D., Reams, R., & Hair, J. F. (2014). Partial least squares structural equation modeling (PLS-SEM): A useful tool for family business researchers. *Journal of Family Business Strategy*, *5*(1), 105–115. doi:10.1016/j.jfbs.2014.01.002

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (Fifth Edit.). England: Pearson Education Limited.

Saunila, M., & Ukko, J. (2014). Intangible aspects of innovation capability in SMEs: Impacts of size and industry. *Journal of Engineering and Technology Management*, *33*, 32–46. doi:10.1016/j.jengtecman.2014.02.002

Sciascia, S., D'Oria, L., Bruni, M., & Larrañeta, B. (2014). Entrepreneurial Orientation in

low- and medium-tech industries: The need for Absorptive Capacity to increase performance. *European Management Journal*, *32*(5), 761–769. doi:10.1016/j.emj.2013.12.007

Sekaran, U., & Bougie, R. (2009). *Research Methods for Business :A Skill Building Approach* (Fifth Edit.). Great Britain: John Wiley& Sons Ltd.

Sen, B. (2010). Theory, research and practice in library management 8: Market orientation. *Library Management*, *31*(4/5), 344–353. doi:10.1108/01435121011046380

Shin, & Aiken. (2012). The mediating role of marketing capability: evidence from Korean companies. *Asia Pacific Journal of Marketing and Logistics*, *24*(4), 658–677. doi:10.1108/13555851211259070

Singh, Y. K. (2006). *Fundamental of Research Methodology and Statistics* (First Edit.). New Delhi: New Age International.

Slater, F. S., & Narver, J. C. (1995). Market Orientation and the Learning Organization. *Journal of Marketing*, *59*(July), 63–74. Retrieved from http://www.jstor.org/stable/1252120

Smith, & Chang, C. (2010). Improving customer outcomes through the implementation of customer relationship management: Evidence from Taiwan. *Asian Review of Accounting*, *18*(3), 260–285. doi:10.1108/13217341011089658

Smith, M., Graca, M., Antonacopoulou, E., & Ferdinand, J. (2008). Absorptive Capacity: A Process Perspective. *Management Learning*, *39*(5), 483–501. doi:10.1177/1350507608096037

Sparrow, J., Tarkowski, K., Lancaster, N., & Mooney, M. (2009). Evolving knowledge integration and absorptive capacity perspectives upon university-industry interaction

within a university. *Education + Training*, *51*(8/9), 648–664. doi:10.1108/00400910911005217

Srivastava, Gnyawali, D. R., & Hatfield, D. E. (2015). Behavioral implications of absorptive capacity: The role of technological effort and technological capability in leveraging alliance network technological resources. *Technological Forecasting and Social Change*, *92*, 346–358. doi:10.1016/j.techfore.2015.01.010

Srivastava, M. K., & Gnyawali, D. R. (2011). When Do Relational Resources Matter? Leveraging Portfolio Technological Resources for Breakthrough Innovation. *Academy of Management Journal*, *54*(4), 797–810. doi:10.5465/AMJ.2011.64870140

Stock, R. M., & Zacharias, N. A. (2010). Patterns and performance outcomes of innovation orientation. *Journal of the Academy of Marketing Science*, *39*(6), 870–888. doi:10.1007/s11747-010-0225-2

Subramanian, A. M. (2012). A Longitudinal Study of the Influence of Intellectual Human Capital on Firm Exploratory Innovation. *IEEE Transactions on Engineering Management*, *59*(4), 540–550. doi:10.1109/TEM.2011.2179648

Sulawesi, N., & Wuryaningrat, N. F. (2013). An Empirical Study on Small and Medium Enterprises Knowledge Sharing , Absorptive Capacity and Innovation Capabilities : *International Journal of Business*, *15*(1), 61–78.

Sun, P. Y. T., & Anderson, M. H. (2010). An Examination of the Relationship Between Absorptive Capacity and Organizational Learning, and a Proposed Integration. *International Journal of Management Reviews*, *12*(2), 130–150. doi:10.1111/j.1468-2370.2008.00256.x

Suying, G., Rong, C., Zhang, Y., & Zhang, S. (2011). The Impact of Human Capital on

Technological Innovation Capability ---Data from Beijing ' Tianjin ' and Hebei Regions. In *E -Business and E -Government (ICEE), 2011 International Conference* (pp. 1–4). doi:978-1-4244-8694-6/11/$26.00

Taghian, M. (2010). Marketing planning: Operationalising the market orientation strategy. *Journal of Marketing Management*, *26*(9-10), 825–841. doi:10.1080/02672571003683813

Tas, D. (2012). Endemic corruption in the Iraqi public sector: Can anti-money laundering measures provide the cure? *Journal of Money Laundering Control*, *15*(4), 458–482. doi:10.1108/13685201211266033

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, *18*(7), 509–533. doi:0143-2095/97/070509-25$17.50

Tenenhaus, M., Vinzi, V. E., Chatelin, Y.-M., & Lauro, C. (2005). PLS path modeling. *Computational Statistics & Data Analysis*, *48*(1), 159–205. doi:10.1016/j.csda.2004.03.005

Tepic, M., Fortuin, F., Kemp, R. G. M., & Omta, O. (2014). Innovation capabilities in food and beverages and technology -based innovation projects. *British Food Journal*, *116*(2), 228–250. doi:10.1108/BFJ-09-2011-0243

Todorovic, Z. W., & Ma, J. (2008). Entrepreneurial and market orientation relationship to performance: The multicultural perspective. *Journal of Enterprising Communities: People and Places in the Global Economy*, *2*(1), 21–36. doi:10.1108/17506200810861230

Tsai, W. (2001). Knowledge Transfer in Intraorganizational Networks : Effects of Network

Position and Absorptive Capacity on Business Unit Innovation and Performance. *Academy of Management Journal*, *44*(5), 996–1004. doi:10.2307/3069443

Tseng, C.-Y., Pai, D. C., & Hung, C.-H. (2011). Knowledge absorptive capacity and innovation performance in KIBS. *Journal of Knowledge Management*, *15*(6), 971–983. doi:10.1108/13673271111179316

Tsiotsou, R. H., & Vlachopoulou, M. (2011). Understanding the effects of market orientation and e-marketing on service performance. *Marketing Intelligence & Planning*, *29*(2), 141–155. doi:10.1108/02634501111117593

Tuominen, M., & Hyvönen, S. (2004). Organizational Innovation Capability: A Driver for Competitive Superiority in Marketing Channels. *The International Review of Retail, Distribution and Consumer Research*, *14*(3), 277–293. doi:10.1080/0959396041000167841 7

Türker, M. V. (2012). A model proposal oriented to measure technological innovation capabilities of business firms – a research on automotive industry. *Procedia - Social and Behavioral Sciences*, *41*, 147–159. doi:10.1016/j.sbspro.2012.04.019

Type, A., & Marketing, I. (2016). Types of embedded ties in buyer-supplier relationships and their combined effects on innovation performance. *Journal of Business & Industrial Marketing*, *31*(2), 1–35.

USAID. (2011). USAID Participates at the 4th Iraq Agro-Food Expo in Erbil. Retrieved from http://www.usaid.gov/news-information/press-releases/usaid-participates-4th-iraq-agro-food-expo-erbil

Ven, A., & Huber, G. (1990). Longitudinal Field research Methods for Studying Processes of Organizational Change. *Organization Science*, *1*(3), 213–219.

Verhees, F. J. H. M., Meulenberg, M. T. G., & Pennings, J. M. E. (2010). Performance expectations of small firms considering radical product innovation. *Journal of Business Research*, *63*(7), 772–777. doi:10.1016/j.jbusres.2009.06.006

Wales, W. J., Gupta, V. K., & Mousa, F.-T. (2011). Empirical research on entrepreneurial orientation: An assessment and suggestions for future research. *International Small Business Journal*, *31*(4), 357–383. doi:10.1177/0266242611418261

Wales, W. J., Parida, V., & Patel, P. C. (2013). Research Notes and Commentaries Too Much of a Good Thing ? Absorptive Capacity , Firm performance , and the Moderating Role of Entrepreneurial Orientation. *Strategic Management Journal*, *633*(October 2012), 622–633. doi:10.1002/smj

Wang, & Han, Y. (2011). Linking properties of knowledge with innovation performance: the moderate role of absorptive capacity. *Journal of Knowledge Management*, *15*(5), 802–819. doi:10.1108/13673271111174339

Wang, Lu, I., & Chen, C. (2008). Evaluating firm technological innovation capability under uncertainty. *Technovation*, *28*(6), 349–363. doi:10.1016/j.technovation.2007.10.007

Wang, C. L., & Altinay, L. (2012). Social embeddedness, entrepreneurial orientation and firm growth in ethnic minority small businesses in the UK. *International Small Business Journal*, *30*(1), 3–23. doi:10.1177/0266242610366060

Wang, C. L., & Chung, H. F. L. (2013). The moderating role of managerial ties in market orientation and innovation: An Asian perspective. *Journal of Business Research*, *66*(12), 2431–2437. doi:10.1016/j.jbusres.2013.05.031

Weerawardena, J., & Coote, L. (2001). An Empirical Investigation into Entrepreneurship and Organizational Innovation-based Competitive Strategy. *Journal of Research in*

Marketing and Entrepreneurship, *3*(1), 51–70. doi:10.1108/14715200180001477

Weigelt, C., & Sarkar, M. B. (2012). Performance Implication of Outsourcing for Technological Innovation: Managing the Efficiency and Adaptability trade-Off. *Strategic Management Journal*, *216*(November 2009), 189–216. doi:10.1002/smj

Westerberg, M., & Frishammar, J. (2012). Innovation Performance. *Journal of Small Business Management*, *50*(2), 283–309. doi:10.1111/j.1540-627X.2012.00354.x

Wetzels, M., Schröder, G., & Oppen, C. (2009). Using PLS path Modeling for Assessing Hierarchical Construct Models: Guidelines and Empirical Illustration. *MIS Quarterly*, *33*(1), 177–195.

Wiklund, J., & Shepherd, D. (2003). Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strategic Management Journal*, *24*(13), 1307–1314. doi:10.1002/smj.360

Williams, J. E. M. (2003). Export information use in small and medium-sized industrial companies: An application of Diamantopoulos' and Souchon's scale. *International Marketing Review*, *20*(1), 44–66. doi:10.1108/02651330310462266

Xia, Z., Yu, H., Xia, Y., & Li, W. (2011). Effects of Human Capital on Technological Innovation: A Literature Review. In *2011 International Conference on Management and Service Science* (pp. 1–3). Ieee. doi:10.1109/ICMSS.2011.5998073

Yamamoto, Y., & Bellgran, M. (2013). Four Types of Manufacturing Process Innovation and their Managerial Concerns. *Procedia CIRP*, *7*, 479–484. doi:10.1016/j.procir.2013.06.019

Yeşil, S., Koska, A., & Büyükbeşe, T. (2013). Knowledge Sharing Process, Innovation Capability and Innovation Performance: An Empirical Study. *Procedia - Social and*

Behavioral Sciences, *75*, 217–225. doi:10.1016/j.sbspro.2013.04.025

Yolles, M., Fink, G., & Dauber, D. (2011). Organisations as emergent normative personalities: part 1, the concepts. *Kybernetes*, *40*(5/6), 635–669. doi:10.1108/03684921111142223

Yozgat, Şişman, & Gemlik. (2012). The Assessment of Viewpoint to Core Competence Understanding of Successful Companies in Developing Countries (The Case Study of Turkey). *International Journal of Business and Social Science*, *3*(6), 25–32.

Zahra & George, G. (2002). Absorptive capacity: A review, Reconceptualization, and Extension. *Academy of Management Review*, *27*(2), 185–203. doi:10.5465/AMR.2002.6587995

Zahra, S. a. (2008). Being entrepreneurial and market driven: implications for company performance. *Journal of Strategy and Management*, *1*(2), 125–142. doi:10.1108/17554250810926339

Zahra, S. a., & Hayton, J. C. (2008). The effect of international venturing on firm performance: The moderating influence of absorptive capacity. *Journal of Business Venturing*, *23*(2), 195–220. doi:10.1016/j.jbusvent.2007.01.001

Zawislak, P. A., Alves, A. C., Tello-gamarra, J., Barbieux, D., & Reichert, F. M. (2012). Innovation Capability : From Technology Development to Transaction Capability. *J. Technol. Manag. Innov*, *7*(2), 14–28.

Zebal, M. A., & Goodwin, D. R. (2012). Market orientation and performance in private universities. *Marketing Intelligence & Planning*, *30*(3), 339–357. doi:10.1108/02634501211226302

Zellweger, T. M., Nason, R. S., & Nordqvist, M. (2011). From Longevity of Firms to

Transgenerational Entrepreneurship of Families: Introducing Family Entrepreneurial Orientation. *Family Business Review*, *25*(2), 136–155. doi:10.1177/0894486511423531

Zhang, J., Benedetto, C. A. D., & Hoenig, S. (2009). Product Innovation Performance , and the Mediating Role of Knowledge Utilization : Evidence from Subsidiaries in China. *Journal of International Marketing*, *17*(2), 42–58.

Zhang, J., & Duan, Y. (2010). The impact of different types of market orientation on product innovation performance: Evidence from Chinese manufacturers. *Management Decision*, *48*(6), 849–867. doi:10.1108/00251741011053433

Zhang, Z., Wu, H., Zhang, X., & Zhou, G. (2009). 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* (pp. 1922–1926). Ieee. doi:10.1109/ICIEEM.2009.5344279

Zhao, X., & Liang, L. (2011). The impact of openness on innovation performance of China's firms: From the perspective of knowledge attributes. In *2011 IEEE International Conference on Industrial Engineering and Engineering Management* (pp. 1078–1082). Ieee. doi:10.1109/IEEM.2011.6118081

Zhou, Minshall, T., & Hampden-Turner, C. (2010). Building Innovation Capabilities: an Inquiry Into the Dynamic Growth Process of University Spin-Outs in China. *International Journal of Innovation and Technology Management*, *7*(3), 273–302. doi:10.1142/S0219877010002082

Zhou, K. Z., & Tse, D. K. (2005). The Effects of Strategic Orientations on Technology- and Market-Based. *Journal of Marketing*, *69*(April), 42–60.

doi:http://dx.doi.org/10.1509/jmkg.69.2.42.60756

Zikmund, W., Babin, B., Carr, J., & Griffin, M. (2010). *Business Research Methods* (Eighth Edi.). Canada: South-Western,Cengage Learning.

Zortea-Johnston, E., Darroch, J., & Matear, S. (2011). Business orientations and innovation in small and medium sized enterprises. *International Entrepreneurship and Management Journal*, *8*(2), 145–164. doi:10.1007/s11365-011-0170-7