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Strategic Ambidexterity Role in Product Innovativeness of Industrial Small and Medium-Sized Enterprises in Jordan: A Conceptual Paper

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Abstract

The level of product innovativeness in Jordan is low. It is therefore beneficial to maintain a balance between exploration and exploitation to improve the innovativeness of products. This conceptual study aims to examine the factors that influence the product innovativeness in Jordanian industrial SMEs. Three anchor theories have been used to conceptualise product innovativeness: Resource-based theory, Dynamic capability theory and Contingency theory. This study examines product innovativeness from the dynamic capability perspective, while also considering the impact of a firm's resources from the resource-based perspective and the environment in which a firm operates based on Contingency theory. The quantitative method employed, and data gathered through cross-sectional questionnaires. The data was analysed using the Smart-PLS 3.3.3 structural equation model. This study has proven beneficial for 1753 Jordanian industrial SMEs. The findings of this study provide practical recommendations and guidelines for policymakers and the government to assess their current policies and strategies to establish a framework for promoting product innovation in Jordanian industrial SMEs.

Keywords: Strategic Ambidexterity, Product Innovativeness, Manufacturing Agility, Market Dynamism, Industrial SMEs in Jordan

Introduction

Jordanian industrial SMEs are facing more challenges to make their products more competitive by innovativeness under these difficult and unfair circumstances, the Jordanian industrial SMEs were required to improve the low level of product innovativeness that

competed with those made in Europe, China, Turkey, and the Gulf and matched them in price and quality, which is far beyond the capacity of the Jordanian developing sector at this time (Fanek, 2015).
The Global Innovation Index (GII) is jointly published by Cornell University, INSEAD Business School, and the World Intellectual Property Organisation (a specialised agency of the United Nations). This Index ranks many economies across the globe according to their innovation capabilities. Over time, the GII has become a framework for governments and the private sector to use in evaluating their economies' performance in innovation. However, it was reported in Global Innovation Index (GII) that Jordan ranks 78th out of 132 countries in terms of innovativeness (radical, incremental) relative to the rest of the Arab world (WIPO, 2023).

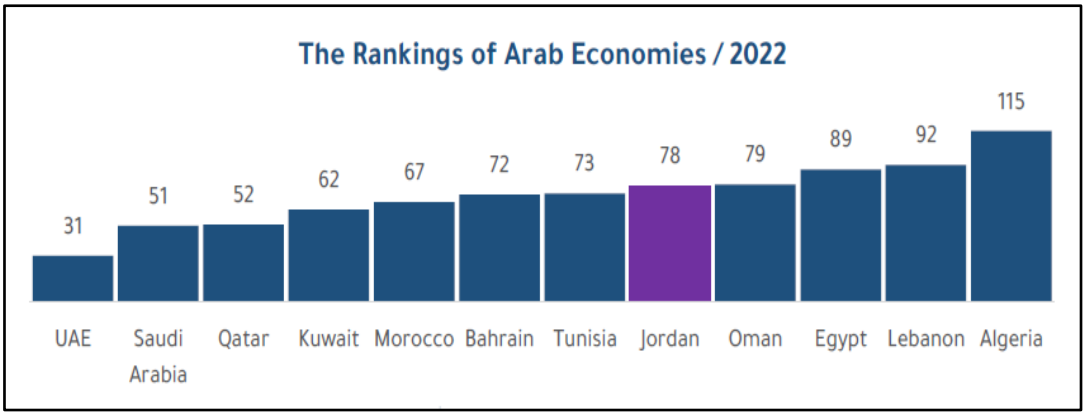

Figure 1: The Ranking of Arab Economies innovation in 2022 (WIPO, 2023)

Recent research has shown that strategic ambidexterity can help to promote product innovativeness, and it is critical for encouraging product innovativeness because it allows companies to effectively combine the requirement for innovation. Jordanian industrial SMEs need both strategic ambidexterity and manufacturing agility which important for enhancing product innovativeness due to limited resources, the dynamic nature of markets and the need to balance exploration and exploitation activities (AbuZaid, 2016; Kustyadji & Wijayani, 2021), by simultaneously focusing on both incremental improvements to existing products and exploring new opportunities, capabilities, and resources to produce new products, SMEs can adapt to changing customer preferences and technological advancements effectively and enhance the level of product innovativeness (Jacob et al., 2022; Jaidi et al., 2022; Lennerts et al., 2020).
Considering the lack of research on the impact of market dynamism on manufacturing agility and product innovativeness, it is worth noting that Jordanian industrial SMEs often encounter highly competitive environments with increased market dynamism, particularly in the wake of the COVID-19 pandemic. According to contingency theory, the returns on a firm's resource and capability investments are heavily influenced by the environment in which it operates (Ruekert et al., 1985).
Despite the extensive research conducted on product innovativeness in businesses, scholarly literature has not produced coherent theories that could guide ambidexterity for product innovativeness. This could be due to the inconclusive outcomes of the empirical research and the diverse range of factors suggested as influential in previous literature (Tidd, 2001). Resource-based theory (RBT) to conceptualise firm's resources (exploration, exploitation, manufacturing agility as determinant of product innovativeness. Dynamic capability theory is used to conceptualise the strategic ambidexterity and manufacturing agility that drive

product innovativeness and contingency in response to market dynamism. The environment in which a firm operates plays a crucial role in determining the returns on a firm's resource and capability investments.

Literature Review

Exploration

Product innovativeness research has long emphasised the importance of exploration as significant capability drive product innovativeness (Jacob et al., 2022; Ali et al., 2024; Iborra et al., 2020; Lisboa et al., 2011; McCarthy & Gordon, 2011). On the other hand, radical and incremental innovation driven by exploration capability (Lennerts et al., 2020; Arnold et al., 2011, Atuahene-Gima, 2005; de Visser & Faems, 2015). Additional research has shown that greater levels of product differentiation are achieved when there is a combination of exploratory product innovativeness, which involves creating new routines to develop new products, and exploratory marketing, which involves creating new routines to connect new products to customers (O'Cass et al., 2014).

Hence, the following hypothesis is postulated:

H1: Exploration has a positive effect on radical innovation

H2: Exploration has a positive effect on incremental innovation

Exploitation

The relationship between exploitation and radical innovation can be complex complementary or contradictory depending on the context of the industry, companies, or specific innovation process (Lennerts et al., 2020; Arnold et al., 2011, Atuahene-Gima, 2005; de Visser & Faems, 2015). Exploitation concentrates on variety reduction and efficiency improvements in current products, through exploiting existing resources and capabilities it may hinder radical innovation while increasing incremental innovation (Christensen & Bower, 1996).

On the other hand, exploitation focused on maximising the benefit of current capabilities through refinement, production, efficiency, selection, implementation in existing products (Tamayo-Torres et al., 2014). Conversely, incremental innovation is the outcome of exploitative activities and can be defined by introducing relatively minor changes to the existing product. This approach often reinforces the dominance of established firms and capitalises on the potential of the established design. Hence, the following hypothesis is postulated:

H3: Exploitation has a negative effect on radical innovation

H4: Exploitation has a positive effect on incremental innovation

Manufacturing Agility

The literature of exploration indicates that manufacturing agility is improved (Tamayo-Torres et al., 2014; Aslam et al., 2020; Lee et al., 2015). Exploration is linked to the discovery of new capabilities and resources, and the development of new products through innovative search variation, risk-taking, experimentation, and flexibility (Tamayo-Torres et al., 2014). Meanwhile, manufacturing agility aims to provide custom solutions while combining the effectiveness of lean manufacturing with the operational flexibility of the flexible model, manufacturing agility focused on product innovativeness demanded by the customers (Hormozi, 2001). When a company invests in exploration, it often leads to the discovery of new manufacturing techniques which allow firms to adapt more quickly to changing customer preferences or market dynamics and innovate their products (Dev et al., 2014).

While companies exploit resources and capabilities effectively, these firms can enhance their manufacturing agility and optimizing production processes to maximize performance and enhance product innovativeness based on resource-based view theory (Barney, 1991).

On the other hand, Product innovativeness research has consistently underscored the significance of manufacturing agility as a critical capability that drives incremental and radical innovation (Abourokbah et al., 2023; Leite & Braz, 2016; Oliveira, 2017). Manufacturing agility is designed to provide customised solutions by integrating the operational flexibility of the flexible model with the effectiveness of lean manufacturing. It is centred on the innovativeness of products that customers demand (Hormozi, 2001). The manufacturing industry is investing heavily in developing the knowledge and skills required to anticipate and meet consumer needs in a proactive manner. According to many studies the researchers argue that agile manufacturing may help to anticipate and meet consumer needs in a proactive manner and enhance radical and incremental innovation (Abourokbah et al., 2023). Hence, the following hypothesis is postulated:

H5: Manufacturing agility is positively affected by Exploration

H6: Manufacturing agility is positively affected by Exploitation

H7: Manufacturing agility has a positive effect on radical innovation.

H8: Manufacturing agility has a positive effect on incremental innovation.

Mediating Relations

Several product innovativeness initiatives fail because managers focus on exploring and exploiting opportunities, capabilities and resources but ignore the importance of being agile to grab those opportunities, capabilities, and resources. The impact of ambidexterity on agility has been supported in both operation management and supply chain (Tamayo-Torres et al., 2014; Aslam et al., 2020; Lee et al., 2015). On the other hand, the literature showed some link between radical and incremental innovation with agility (Abourokbah et al., 2023; Leite & Braz, 2016; Oliveira, 2017).

Companies explore and exploit new capabilities and technologies, through manufacturing agility and quick response it will provide new products to meet customer demand and dynamic environment based on dynamic capability theory (Teece et al., 1997). In view of these literature, it is questionable whether the manufacturing agility is a missing link between ambidexterity and radical, incremental innovation. Hence, the following hypothesis is postulated:

H9: Manufacturing agility mediates the relationship between exploration and radical innovation.

H10: Manufacturing agility mediates the relationship between exploration and incremental innovation.

H11: Manufacturing agility mediates the relationship between exploitation and radical innovation.

H12: Manufacturing agility mediates the relationship between exploitation and incremental innovation.

Moderating Role

Market dynamism measures the level of change, instability, and unpredictability in a specific market or industry. Customer preferences and demand are constantly evolving in dynamic markets. These changes create a sense of urgency for managers to continually seek new

opportunities for innovation and the introduction of new products or services (Garg et al., 2003; Jansen et al., 2006).

A few studies have linked market dynamism to innovation. Although some researchers found significant relationship between market dynamism and innovation (Baccarella et al., 2022; Nie et al., 2022; Ranjan, 2024; Zhang et al., 2020). Baccarella et al (2022) empirically discovered that organisational support for creativity had a more significant impact on the innovation performance of firms in highly dynamic markets than in less dynamic markets. This was based on the context of industrial companies in Germany.

The influence of market dynamism on a company's ability to adapt and thrive in a rapidly changing business environment is the reason it is important in moderating the relationship between product innovativeness and manufacturing agility. The requirements and preferences of customers are subject to rapid change in dynamic markets. Companies that possess manufacturing agility are capable of promptly responding to these advancements. Rapid product changes might not be necessary in a static market, but innovation in a dynamic market is dependent on the ability to align products with changing customer demands. Many studies have linked market dynamism with agility (Khan et al., 2022; Sáenz et al., 2018). Consequently, the following hypothesis is postulated:

H13: The positive relationship between manufacturing agility and radical innovation will be stronger when market dynamism is high

H14: The positive relationship between manufacturing agility and incremental innovation will be stronger when market dynamism is high

Research Methods

Overview of the Proposed Research Model

The researchers reviewed previous related literature to formalise the hypothesised constructs and their relationships in this study's research model. The proposed model is depicted in Figure 2.

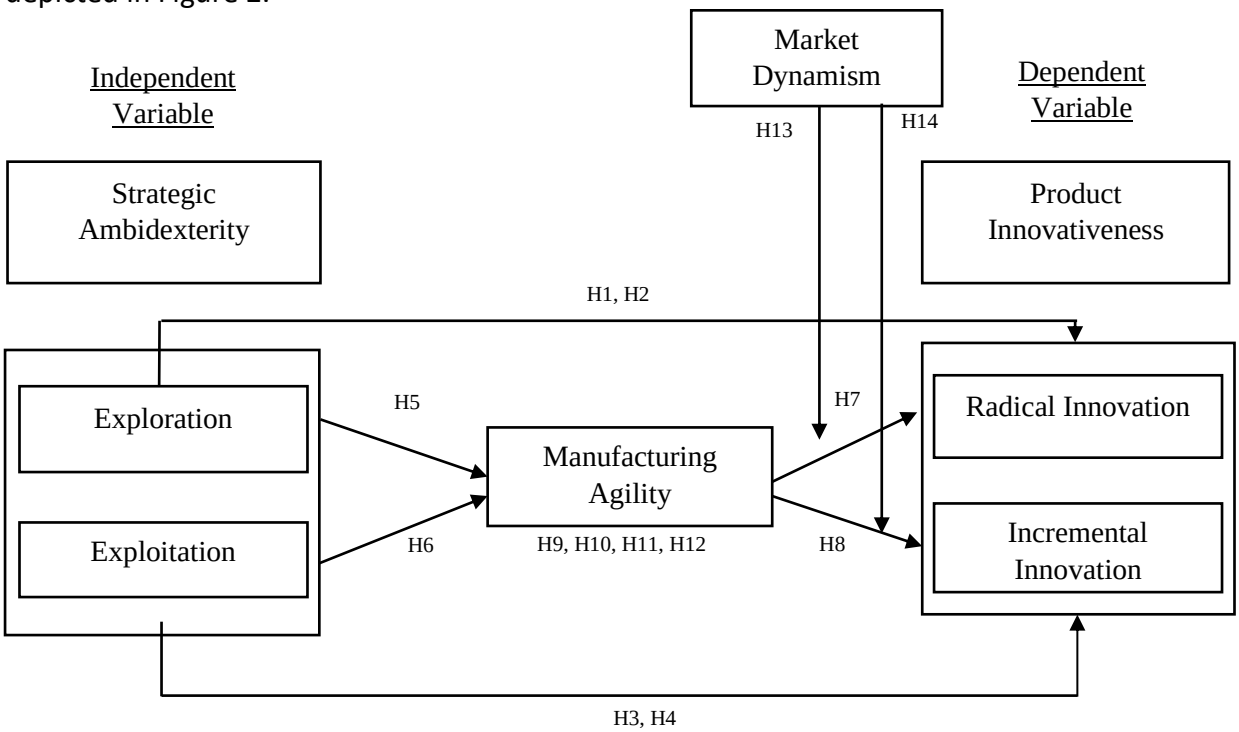

Figure 2: Research model

Development of Instrument

The current study uses a questionnaire. The questionnaire is a self-report instrument that can help measure managerial staff responses to all of the study variables. Questionnaire data collection saves time and is less expensive than other methods of gathering information. The items must have varying degrees of difficulty (in a Likert-scale questionnaire, difficulty is often termed endorse ability) so that the scale's entire response range (e.g., 1-5, 1-7) is used (Nemoto & Beglar, 2013). By creating a survey with 7-point and 5-point Likert-type scales, common method bias was reduced (Jordan & Troth, 2019). Additionally, the questionnaire includes both positive and negative items. The survey's reverse item was included to reduce respondent bias and to increase the measurements' validity (Podsakoff et al., 2003).

Back-translation procedures are recommended by several researchers, back -translation defined as the original language was translated to the target language and retranslating to the original language (Shigenobu, 2007). To ensure that the translation performed on the research instrument is accurate (Brislin, 1970). The English version of the survey questionnaire was translated into Arabic using a back-translation technique.

To evaluate the constructs of this research, validated instruments were adapted from related prior studies. Additionally, five questionnaires were distributed to the managers of industrial SMEs in Jordan because the terms or phrases used are not commonly used in the context of Jordanian industrial SMEs or due to cultural considerations. A pre-test is required to address any potential issues that may arise during the study. As a result, the five managers were asked to provide feedback by writing their comments or recommendations on questionnaires. To ensure that this research uses a well-validated instrument.

Sampling Frame and Sample Size

The population under investigation in this study comprises Jordanian industrial SMEs located in Jordan, as reported by the Jordan Chamber of Industry, Irbid Chamber of Industry, and Zarqa Chamber of Industry. The total count of Jordanian industrial SMEs is 1753 (Irbid Chamber of Industry, 2023; Jordan Chamber of Industry, 2023; Zarqa Chamber of Industry, 2023). The study's sampling of interest consists of industrial SMEs in Jordan that innovate their own products. Sampling was conducted at the Jordan, Irbid, and Zarqa Chambers of Industry (Irbid Chamber of Industry, 2023; Jordan Chamber of Industry, 2023; Zarqa Chamber of Industry, 2023).

G*Power comprises of one simple correlation test, which is based on the tetrachoric correlation model, G*power is the statistical test for linear regression and coefficients. Also, G*Power 3 has five types of power analysis, mainly a priori analyses, comprise analysis, post hoc analysis, criterion analysis and sensitivity analysis (Verma & Verma, 2020). To ascertain the sample size of respondents, the researcher used the G* power software to compute the minimum size required. The conceptual framework of the present study demonstrated that the maximum number of predictors pointed towards one endogenous construct were seven (Faul & Lang, 2009; Memon et al., 2020). Jenkins and Quintana-Ascencio (2020) have established the medium effect of 0.15 as the most recommended setting for social and business science research, assuming a significance level of α at 0.05 and a statistical power of 0.80 in the input parameters. Researchers are encouraged to establish the sample size using G-power due to its precision and adaptability (Faul et al., 2007). We recommend a minimum sample size of 103, as indicated by the G*power software results.

Data Collection Method

This study is a cross-sectional study that collects data once using a standardised questionnaire to address the research questions. The study follows a descriptive survey research design, where all the study variables are measured simultaneously (Sekaran & Bougie, 2013). The questionnaire consists of six sections and 34 measurement items. Scholars suggest using a questionnaire with 25 to 30 items, which can be completed within 30 minutes to ensure participants' engagement and focus (Sharma, 2022).

Common Method Variance

Concerns have been expressed regarding common method variance (CMV) in self-administered questionnaires. There is a possibility that CMV will produce an incorrect internal consistency, affecting the findings. Podsakoff et al. (2003) recommended using Harman's single factor to test the presence of CMV. The exploratory factor analysis was implemented to identify CMV, during which all variables were subjected to the unrelated factor analysis test (Podsakoff et al., 2003).

Data Analysis and Results

In this investigation, the Partial Least Squares (PLS) with Smart PLS 3.3.3 structural equation model and the statistical package for social science (SPSS) software (version 26) were implemented to conduct hypotheses testing and data analysis. The analytical methods implemented consist of factor analysis, reliability analysis, descriptive statistics, multiple regression, and bivariate analysis. The multivariate analysis employed a structural equation model for hypothesis testing and causal modelling. This model seeks to elucidate the relationships between multiple variables (Hair et al., 2014).

The structural equation model enables researchers to analyse multiple independent and dependent constructs simultaneously, allowing them to address interconnected research questions in a comprehensive and systematic manner. Structural equation modelling (SEM) is a statistical method that integrates multiple regression techniques to estimate a set of interconnected dependence relationships simultaneously (Chin, 1998; Ullman & Bentler, 2012).

The researcher initiates the process by evaluating the measurement model to determine the reliability and validity of the measurements (Hair et al., 2021). This will allow them to specify the nature of each variable. Subsequently, they implement the structural model assessment procedures to evaluate the hypothesised relationships between the constructs and ascertain their interrelationships (Hair et al., 2021).

Contributions of Study

This study makes significant contributions in terms of practicality, and theory to the literature of strategic ambidexterity and product innovativeness among the industrial SMEs in Jordan. The initial theoretical contribution is to address the gap in the existing literature, which has recognised the significance of ambidexterity and agility in the context of product innovation. However, there has been insufficient attention paid to address how they work together to achieve a higher level of product innovativeness (radical, incremental). The proposed model incorporates market dynamism as a moderator, which is a significant addition to the existing literature. Given that the role of market dynamism has not been investigated in the context of manufacturing agility and product innovativeness, this study evaluates the moderating effect of market dynamism on the impact of manufacturing agility on product innovativeness.

The second contribution is the addition of new knowledge to the body of research on product innovativeness in the context of industrial companies in Jordan, making it one of the first studies to employ this approach. Third, the current study's findings and recommendations are useful for future research, particularly in industrial SMEs. Fourth, this research also contributes to the literature through the integration of three theories, RBV resource-based view theory (Barney, 1991), dynamic capability theory (Teece et al., 1997) and contingency theory (Lawrence & Lorsch, 1967). This study's proposed framework establishes a connection between these theories and strategic ambidexterity (exploration and exploitation), product innovativeness (radical, incremental), and market dynamism. As a result, it offers a more explicit perspective.

In terms of practical contributions, this study will add to our understanding of industrial SMEs in Jordan, which are facing numerous challenges in terms of product innovation, affecting firm competitiveness and living standards. Jordan ranks 78th out of 132 countries according to the 2022 Global Innovation Index (WIPO, 2023). It was also reported that its product innovativeness level is poor as Jordan produces less product innovativeness outputs relative to its level of innovation investments (WIPO, 2023; Jordan Strategy Forum, 2023) understanding the factors that influence product innovativeness is extremely important. This research enhances understanding of the influence of these factors on product innovativeness (radical, incremental) by presenting data and analyses. This research offers practical recommendations and a significant record of the industrial SMEs in Jordan. The record demonstrates the challenges that industrial SMEs faced. Furthermore, the findings of this study provide valuable insights and suggestions for government officials and policymakers to assess their current policies and strategies to establish a framework that promotes product innovation (both radical and incremental) among SMEs in Jordan. Some government agencies that could benefit from this study include the Jordan Chamber of Industry, Amman Chamber of Industry, and Jordan Enterprise Development Corporation (JEDCO).

Limitations and Suggestions for Future Work

First, the scope of this research was limited to the strategic ambidexterity role in product innovation among Jordanian industrial SMEs. Furthermore, it investigates manufacturing agility as a link between strategic ambidexterity and product innovation. Besides, investigate market dynamism as a moderator for the relationship between manufacturing agility and product innovation. The model could be applied to other sectors, such as the commercial sector, which includes hotels and restaurants, and the agriculture sector, in future studies. This could yield new results and enhance the predictive power of the model. This study's second limitation is its emphasis on the Hashemite Kingdom of Jordan, a developing country in the Middle East. For future research, the model can serve as a foundation for the creation of models for neighbouring countries with comparable backgrounds. In conclusion, this investigation exclusively concentrates on industrial SMEs in Jordan. The results' validation and generalisation are, therefore, restricted to this sector.

Conclusion

Today, product innovativeness is crucial since innovation efforts can enhance productivity, reduce costs, increase competitiveness, create higher-paying jobs, and increase sales and profits. Jordan's Industrial companies are one of the most important sectors in the country's economy as it is one of the major sectors for job creation and Jordanian economic engine is virtually entirely comprised of SMEs. For example, in Jordan, SMEs accounted for 95% of the

business market. However, according to various reports, the level of product innovativeness in Jordan is low, necessitating the identification and explanation of factors that could increase product innovativeness.

Understanding these factors is essential for both industrial companies and for the Jordanian government to achieve their goal of becoming a leading country in innovation. By considering these factors, the government and policy makers can develop strategies to enhance innovation and offer superior products.

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