The Mediating Role of Organizational Agility on the Relationship between Environmental Uncertainty and Innovation in Hotels

Yasser Abdel-Aty[1] **Hytham Deraz**[2]
[1]Faculty of Tourism and Hotels, Sadat City University
[2] Sinai High Institute for Tourism and Hotels, Ras Sidr

Abstract
Organizational agility leads to many positive outcomes for hotels, such as adapting to and surviving in a volatile, uncertain, and dynamic environment, increasing product or service quality, etc. In addition, agility has become essential for different types of innovation. As agility is of crucial importance for hotels, they must be aware of its effects. Thus, this study aimed at determining the degree of environmental uncertainty (EU) in hotels; assessing the agility and innovation in hotels; investigating how the EU influences innovation dimensions, and finally examining the effect of agility as a mediating variable on the relationship between EU and innovation in hotels. The research population was the department managers and supervisors in five-star hotels in Greater Cairo. The convenience sampling method was adopted to attain the objectives of this research. A total of 480 questionnaire forms were handed out to the respondents. The questionnaires valid for analysis were 420, with a response rate of 87.5 percent. To analyze these forms, descriptive analysis, correlation analysis, and multiple regression analysis were used. The main results revealed that the EU has a positive effect on the four dimensions of hotel innovation (i.e., product innovation, process innovation, organizational innovation, and marketing innovation). Additionally, the results showed that organizational agility fully mediates the impact of the EU on the four dimensions of hotel innovation. Hence, it was recommended that hotels should continue with the best practices of organizational agility.

***Keywords*:** Agility, environmental uncertainty, innovation.

Introduction
Innovation can be considered one of the main determinants of organizational performance. It is defined as an organization's capability to create novel ideas about products, services, or processes (Koskela-Huotari *et al.*, 2016; Kafetzopoulos *et al.*, 2020; Harif *et al.*, 2022). Innovation also refers to all methodical, technological, technical, economic, and commercial activities that are often established and developed to enhance consumer experiences, new hotel services, and new attractions. This leads to a temporary monopoly in the market (Buhalis and Sinarta, 2019, Shamim *et al.*, 2021; Donate *et al*., 2022).

In an uncertain environment characterized by changing customer preferences and attitudes, firms are forced to seek alternatives through innovation (Mandal, 2016; Mukherji and Mukherji, 2017; Inman and Green, 2021). Also, firms must promote process innovation to achieve strategic advantage and develop new capabilities (Saeed *et al.*, 2021). Environmental uncertainty refers to the incapability to predict the future of the market environment due to factors including difficulties in forecasting and understanding environmental circumstances, insufficiency of justification and

empirical foundations of knowledge (Kafetzopoulos *et al.*, 2020), as well as lack of information about the cause-effect relationships (Darvishmotevali *et al*., 2020).

Environmental uncertainty is a major problem facing organizations. It is one of the main emergencies that should be taken seriously by companies (Gligor *et al*., 2019). It is a major factor influencing the organizational structure (Ehtesham Rasi *et al*., 2019) and a very important issue in the strategic management literature (Inman and green, 2021).

The higher the level of environmental uncertainty that organizations are exposed to, the greater their interest in achieving continuous growth in their organizational agility (Inman and green, 2021). Determining effective strategies (such as organizational agility) to cope with environmental uncertainty is very important for hotels because it helps decision-makers to keep up their constantly high performance and boost their competitiveness (Darvishmotevali *et al*., 2020).

Organizational agility is the capability of the organization to take a clear and accurate reaction to anticipated and unanticipated changes in its environment to increase product or service quality based on customer satisfaction and customer demand, and foster creativity (Findsrud, 2020; Sjödin *et al.*, 2020; Puriwat and Hoonsopon, 2021). Moreover, it is one of the main factors for an organization to introduce novel products to the market using market knowledge, such as product mix, competitor's action, service pricing, market expansion, and technology adoption (Darvishmotevali *et al*., 2020; Manurung and Kurniawan, 2021).

There are several research gaps on the topics of environmental uncertainty, innovation, and agility, particularly in the hospitality field as follows. First, the impact of environmental uncertainty on the four types of innovation (i.e., product, process, organizational, and marketing) has not yet been assessed (Ehtesham Rasi *et al*., 2019). Second, the existing environmental uncertainty research has been undertaken mainly in developed countries. However, it needs to be enriched in developing countries (Chen *et al*., 2022). Third, despite the abundance of studies that have investigated the role of mediators of environmental uncertainty (e.g., Inman and green, 2021), to the best of the authors' knowledge, there are no studies in the field of the hospitality industry examining organizational agility as a mediator of environmental uncertainty. Fourth, Kale *et al*., (2019) and Inman and green (2021) stated that there appears to be little research on the relationship between environmental uncertainty and organizational agility in the tourism and hospitality literature. Fifth, research on innovation in the hospitality industry is rather limited compared to research in other service industries (Sharma *et al*., 2021). Sixth, there are calls for research on agility from several academics (e.g., Christofi *et al*., 2021; Škare and Ribeiro, 2021; Hadjielias *et al*., 2022) who emphasized that agility has not been widely covered in hospitality literature. Finally, the hospitality literature has very few studies linking organizational agility and innovation (Al-Qaralleh and Atan, 2022).

Accordingly, this research comprises five objectives: (1) to investigate the three dimensions of the EU (i.e., competitive, market, and technological); (2) to examine the extent to which organizational agility is applied in five-star hotels; (3) to assess the four dimensions of innovation in five-star hotels; (4) to identify the effect of EU on innovation in five-star hotels; and (5) to investigate the impact of organizational agility as a mediating variable on the relationship between EU and innovation.

Literature review

Agility

Within hotels, three types of agility can be found. The first type (i.e., sensing agility) identifies all activities that stimulate performance by gathering and analyzing diverse types of data on consumers, competitors, and suppliers. The second type (i.e., decision-making agility) means the organization's capability to obtain information and use it to make appropriate and effective decisions that ensure increased profitability and reduced risks (ZareRavasan, 2021). The third type (i.e., acting agility) means that the business plan includes new policies related to customers, participants, and partners (Manurung and Kurniawan, 2021; Annosi *et al*., 2022).

Organizational agility is defined as an organization's responsiveness and ability to meet both continual and unpredictable changes in markets (Manurung and Kurniawan, 2021) to enable the organization to: create new value through coordination and integration of different activities, procedures, and tasks (Yildiz and Aykanat, 2021), gain a competitive advantage by reacting quickly and effectively to changing markets (Abrishamkar *et al.*, 2021), and enhance profitability by using the external and internal processes of the organization (Kazancoglu, 2022). In addition, hotel agility built on multidimensional skills allows hotels to adapt to and survive in a volatile, uncertain, and dynamic environment (Kale *et al.*, 2019; Liu and Yang, 2019). It also enables hotels to improve cooperation with consumers and enhance internal communication (Berg *et al.*, 2020, Puriwat and Hoonsopon, 2021; Cyfert *et al*., 2022).

Agility dimensions

Agility has three dimensions: customer agility, partnering agility, and operational agility. Customer agility refers to making the customer a partner in identifying and optimizing opportunities. Partnering agility is defined as the capability to utilize suppliers and operational flexibility to achieve desired objectives quickly and accurately. Operational agility is defined as the capability to respond to changes and make new modifications quickly and accurately (Panda and Rath, 2018; Asil, 2019; Gligor *et al.*, 2019). If the organization can combine these three dimensions, it will be able to forecast work-related outcomes more accurately than relying on any of the separate dimensions because of the collaborative interaction between the three dimensions (Hussain and Malik, 2022; Sadeghi *et al*., 2022).

Environmental uncertainty

The concept of environmental uncertainty revolves around the lack of sufficient information during the decision-making process, which results from the organization's inability to anticipate market variables such as customer needs, products and services, suppliers, technology, and competitors (Puriwat and Hoonsopon, 2021; Laguir *et al*., 2022; Holzner and Wagner, 2022). In addition, environmental uncertainty is defined as the incapability of the organization to assess the effects of a suitable response to changes in the work environment, e.g., unpredictable markets, quick variations in economic conditions, customer needs, and technological changes (Baba *et al*., 2017; Saeed *et al.*, 2022). Moreover, the inability of the organization to identify these changes affects the success or failure of the decision-making process (Ehtesham Rasi *et al.*, 2019; Pashutan *et al*., 2021; Holzner and Wagner, 2022).

Dimensions of environmental uncertainty

Three dimensions of environmental uncertainty were identified by previous research (e.g., Darvishmotevali *et al*., 2020) as follows:

1. Competitive environment uncertainty

Competitive environment uncertainty occurs as a result of deficient clarity or insufficient visibility about the market movement and its impact on the activities and operations of the organization as well as because of ignorance and lack of sufficient knowledge to solve problems, or to identify customer tastes and preferences. All of these reasons contribute to increasing uncertainty within the target markets (Wang and Fang, 2012; Darvishmotevali *et al*., 2020; Holzner and Wagner, 2022).

2. Technological environment uncertainty

Technological environment uncertainty expresses modifications in an organization's technological possibilities, which means the incapability of the organization to realize or expect the technological environment. This happens due to unfamiliarity with all the technologies that may appear or integrate to create novel ideas or solutions, and thus will affect the competitiveness of the organization (Anderson and Tushman, 2018; Laguir *et al*., 2022).

3. Market environment uncertainty

Uncertainty in the market includes three main sources, a change in the choice and preferences of customers, changes in production processes, and finally competition, which will lead to the difficulty of predicting the future of the market and determining customer needs (Zhang *et al*., 2012; Laguir *et al*., 2022; Panhuman *et al*., 2021; Holzner and Wagner, 2022).

Innovation

Innovation refers to novel concepts, ideas, and better mechanisms to create innovative products or services and reduce stagnation, downturn, and threat to existing businesses (Koskela-Huotari *et al*., 2016; Findsrud, 2020). Innovation is associated with producing drastic changes by turning an invention into a new profitable product or process. It also helps an organization add value to customers by being able to bring about changes in products, processes, and services (Ali *et al*., 2019; Abrishamkar *et al*., 2021; Donate *et al*., 2022; Harif *et al*., 2022).

Besides, innovation helps the organization to maintain efficiency, gain a competitive advantage, and increase the existing market share by observing or discovering new and better methods and techniques to compete in the field (Abrishamkar *et al*., 2021; ZareRavasan, 2021). Furthermore, it assists the organization in identifying and meeting new customers' needs or fulfilling the needs of existing customers with modern methods (Yildiz and Aykanat, 2021; Lee *et al*., 2022; Messabia *et al*., 2022).

Innovation dimensions

Innovation was divided into four dimensions: (a) product innovation, (b) process innovation, (c) organizational innovation, and (d) marketing innovation (Sharma *et al*., 2021; Shin and Perdue, 2022; Donate *et al*., 2022).

(a) Product innovation

Product innovation is often referred to as originality, meaningfulness, novelty, seriousness, creativity, or exceptionality of products. It enables the organization to form a dominant status in the competitive market and meet specific consumers' needs (Wang and Ahmed, 2004; Sharma *et al*., 2021; Lee *et al*., 2022; Messabia *et al*., 2022). Product innovation is divided into two kinds: radical and incremental innovation (Menguc *et al*., 2014). The first includes establishing and generating significance and advantage for the product that did not exist before (Shahin *et al*., 2017). The second comprises adding significance and advantage to an existing product (Hoonsopon and Ruenrom, 2012; Donate *et al*., 2022; Harif *et al*., 2022).

(b) Marketing innovation

Marketing innovation is original or creative techniques and methodologies based on market research, advertising, and promotion methods (Wang and Ahmed, 2004). It enables the organization to endeavor the targeted marketplace and to enter into new marketplaces. Also, marketing innovation is a major and important modification in the shape and design of the product or packaging (Sharma *et al*., 2021; Shin and Perdue, 2022).

(c) Process innovation

Process innovation is a subcomponent of technological innovation, and refers to modifications in the way of generating and creating products or services (Prajogo and Hong, 2008, Kafetzopoulos *et al*., 2020). Process innovation includes innovation in the product itself or innovation in procedures and processes that take advantage of new equipment (Sharma *et al*., 2021; Lee *et al*., 2022; Messabia *et al*., 2022).

(d) Organizational innovation

Organizational innovation is defined as the application of a novel structural technique in corporate performance and practices or external relationships that create value for the organization. Organizational innovation happens when an organization determines gaps in a business situation (Sharma *et al*., 2021; Messabia *et al*., 2022; Donate *et al*., 2022).

The effect of environmental uncertainty on the dimensions of innovation

There are two different views regarding the impact of environmental uncertainty on innovation. First, several researchers (e.g., Mandal, 2016; Mukherji and Mukherji, 2017) reported that when the external environment is more uncertain, management tends to choose a conservative strategy to cope with market shocks and fierce market competition, thus decreasing innovative investment The greater the environmental uncertainty that companies face, the less investment is made in corporate innovation (Chen *et al.*, 2022). Second, on the other hand, Oke *et al.* (2012) reported that companies in uncertain environments tend to invest their efforts in innovations to exploit the opportunities presented by the changing market environments to achieve superior performance. In addition, Darvishmotevali *et al*. (2020) stated that innovation can be encouraged in response to competitive, market, or other environmental influences.

1. The effect of environmental uncertainty on product and process innovation

In an environment characterized by intense competition and unexpected technological progress, technological innovation cycles (e.g., product and process innovation) are short. This makes companies more willing to develop technological capabilities and forces them to invest more in technological competencies to keep pace with the competition (Kafetzopoulos *et al.,* 2020).

2. The effect of environmental uncertainty on organizational innovation

In light of competition and changing market trends, companies seek to come up with renewable products. In addition, firms promote organizational innovation to achieve and maintain competitive advantage (Ganter and Hecker, 2013; Wang *et al.,* 2015; Kafetzopoulos *et al.,* 2020; Messabia *et al*., 2022; Donate *et al*., 2022).

3. The effect of environmental uncertainty on marketing innovation

In addition, organizational innovation helps companies enhance their ability to create new forms of product marketing, which must be able to adapt to new market conditions when uncertainty exists (Ramirez *et al.,* 2018).

Based on the existing literature, it is clear that when there is environmental uncertainty, companies struggle to survive by embracing all four dimensions of innovation. Thus, the following propositions are made.

Hypothesis 1. EU has a positive impact on product innovation.
Hypothesis 2. EU has a positive impact on process innovation.
Hypothesis 3. EU has a positive impact on organizational innovation.
Hypothesis 4. EU has a positive impact on marketing innovation.

The effect of environmental uncertainty on organizational agility

Agility can be an opportunity generated by environmental uncertainty (Nandakumar *et al.,* 2012). The more turbulence in the business environment, the greater the need for agility. With increasing uncertainty and competition in today's environment, companies focus on agility, thus gaining a competitive advantage and adapting to unexpected technological and market changes (Jangga *et al.,* 2015). Companies also develop agile capabilities and adopt various agile practices to reduce the impact of uncertainty (Gligor, 2016; James and George, 2018; Panda and Rath, 2018). Moreover, companies have made agility an important part of their competitive strategy to address environmental uncertainty (Ehtesham Rasi *et al.,* 2019).

The mediating role of organizational agility on the relationship between environmental uncertainty and innovation

Organizational agility is a comprehensive concept that includes the idea of innovation and is obligatory for innovation (Weber and Tarba, 2014; Vecchiato, 2015; Saeed *et al.,* 2022). An agile company has sufficient flexibility and speed to understand new developments, continuously adjust the strategic direction of the company, and use innovative methods of value creation (Yildiz and Aykanat, 2021). Besides, agility helps organizations promote innovation (Nandakumar *et al.,* 2012; Jangga *et al.,* 2015; Yildiz and Aykanat, 2021). An agile organization that has flexibility in its strategy, structure, and operations is usually in a good position to anticipate and respond to changes in market demands by producing innovative products and services as well as

modifying and developing existing products, services, technologies, and standards (Puriwat and Hoonsopon, 2021; Saeed *et al.,* 2022). Therefore, it is theorized that the relationship between environmental uncertainty and the four dimensions of innovation is mediated by organizational agility:

Hypothesis 5: Organizational agility positively mediates the relationship between environmental uncertainty and product innovation.
Hypothesis 6: Organizational agility positively mediates the relationship between environmental uncertainty and process innovation.
Hypothesis 7: Organizational agility positively mediates the relationship between environmental uncertainty and organizational innovation.
Hypothesis 8: Organizational agility positively mediates the relationship between environmental uncertainty and marketing innovation.

Depending on the literature review and the previously mentioned hypotheses, this study suggests the hypothesized model (see Figure 1)

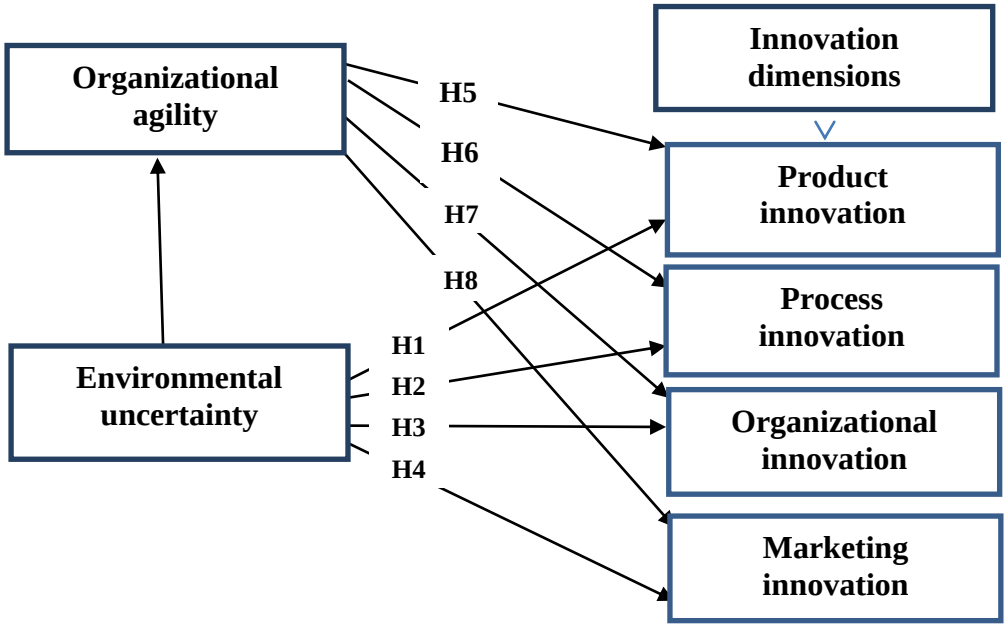

Figure (1): Hypothesized model

Research Methodology

The current study adopted the quantitative approach to investigate the impact of environmental uncertainty on hotel innovation and assesses the influence of organizational agility on the relationship between environmental uncertainty and hotel innovation. Hence, the study includes three different variables: (1) one independent variable (environmental uncertainty); (2) one dependent variable (hotel innovation); and (3) one mediating variable (organizational agility).

Sampling

The population of this study was managers and supervisors in all departments of five-star hotels in Greater Cairo. This category of hotels was selected because the concepts of agility and innovation are applied so that they can be assessed. Besides, it has professional and innovative management as well as highly qualified and creative

human resources. According to Egyptian Hotel Association (2021), there are 28 five-star hotels in Greater Cairo.

After contacting the hotels to explain the purpose of the study and request approval for their hotels to be included in the field study, 24 hotels (60%) permitted managers and supervisors in all hotel departments to fill out the questionnaire forms, while the remaining hotels refused because they believed the data to be confidential and might benefit competitors. The study population was not known because the exact numbers of managers and supervisors in the 24 hotels investigated could not be found. Therefore, the sample size was determined according to Freund and Wilson's (1997) formula:

$$n = \frac{(Z_{\alpha/2})^2 \, p \, (1-p)}{(d)^2}$$

n: the required sample size; z: the value of the standardized normal variant corresponding to the level of the significance; α: the probability of type 1 error; p: estimated prevalence; d: the rate of errors in the population.

A convenience sample of 480 managers and supervisors was chosen to collect data. Convenience sampling refers to the collection of research data from a readily available group of respondents (Kowalczyk, 2015). The questionnaires were distributed among the 24 hotels throughout the period January-February 2022. A total of 420 questionnaires were completed, achieving a response rate of 87.5% which is acceptable (Fincham, 2008).

Measurement and instrument development

A questionnaire, which included four parts, was developed depending on a review of the relevant literature. The first part (i.e., respondents' characteristics) comprised three components which are gender, department, and tenure. The second part (i.e., innovation dimensions) was composed of four sections: product innovation (5 elements); process innovation (4 elements); organizational innovation (5 elements); and marketing innovation (5 elements) adapted from Kafetzopoulos *et al.* (2020). The third part (i.e., environmental uncertainty) consisted of three sections: competitive environmental uncertainty (6 questions); market environmental uncertainty (6 questions); and technological environmental uncertainty (6 questions) adapted from Yildiz and Aykanat (2021). The fourth part focused on assessing the level of organizational agility and comprised 10 items adapted from Inman and Green (2021). All variables in the last three parts of the questionnaire were measured using a five-point Likert scale ranging from "strongly disagree = 1" to "strongly agree = 5".

Reliability and validity of the questionnaire

In this research, content validity was used to review the questionnaire regarding content, measurement, expression, layout, clarity of instructions, language, integrity, and sequence. The questionnaire was distributed to eight hotel managers: two human resources managers, two marketing managers, two food and beverage managers, and two front desk managers in five-star hotels. In addition, the questionnaire was also handed out to 5 professors specializing in hotel studies. Based on the feedback obtained from the pre-test, changes in wording, sequence, instructions, and layouts of the questionnaire were made to improve the final data collection tool. Furthermore, all

items of the questionnaire were used and tested by previous researchers to validate the data collection tool used in the study (Creswell and Creswell, 2017).
Regarding reliability, Cronbach's alpha coefficient for all three variables (i.e., innovation, environmental uncertainty, and organizational agility) was above 0.7. A reliability coefficient of .70 or higher is considered highly credible in social science research (Nunnally and Bernstein, 1994). Therefore, the data collection tool used in this research was reliable.

Data analysis techniques

The statistical package for social sciences (SPSS) for Windows v. 25.0 was used to analyze the data. Descriptive statistics (i.e., means, standard deviations, and correlations) were employed for all variables in the study, which are hotel innovation dimensions, environmental uncertainty, and organizational agility. Moreover, the hierarchal multiple regression was used to investigate the influence of environmental uncertainty on the four dimensions of hotel innovation, to identify the effect of environmental uncertainty on organizational agility, and to examine the influence of organizational agility on the four dimensions of hotel innovation.

Results and discussions

Respondents' profile

Respondents' profiles comprised gender, department, and tenure. Of the 420 managers and supervisors participating in this study, the majority of the respondents were male, with a percentage of 73% and 27% were female. Regarding job department, 35% of the respondents were in the food and beverage department; 20% of them were in the marketing department; 20% of them were in the human resources department; 20% of them were in the front office department, and finally, 5% of them were in other departments. Finally, respondents represent different job tenures: most of them had job tenure of more than 5-10 years with a percentage of 60%; 30% of them worked for 1-5 years, and 10% of them worked for more than 10 years.

A descriptive analysis of organizational agility, environmental uncertainty, and innovation dimensions

Concerning organizational agility, Table (1) shows that the total mean score was 4.51. In addition, all agility items had high average scores ranging from 4.3-4.7, revealing that five-star hotels in Greater Cairo have a high level of organizational agility. This indicates the interest of these hotels to use all their capabilities to take advantage of the opportunities available to them in the work environment, and their willingness to innovate high-quality services and products that meet the needs of customers and create high value. Similarly, this finding is consistent with previous research (Ravichandran, 2018; Sánchez *et al*., 2019; Menon and Suresh, 2021). Besides, several researchers (e.g., Chen, 2019; Puriwat and Hoonsopon, 2021) found that there is a moderate level of agility in the organization. However, as shown in Table (1) the statement "This hotel's strategic vision emphasizes the need for flexibility and agility

to respond to market changes**",** achieved a score of 3.5. This indicates that the hotel management needs to improve its strategic vision regarding agility.

The results also clarified that environmental uncertainty dimensions (i.e., competitive environmental uncertainty, market environmental uncertainty, and technological environmental uncertainty) had a high average mean scores of 4.36, 4.41, and 4.3, respectively. This indicates that the degree of all three types of environmental uncertainty in the hotels is significantly high. Similarly, these results coincide with those of Puriwat and Hoonsopon (2021) but they contradict those of Darvishmotevali *et al.* (2021) who found that there is a low level of agility in the organization.

Table 1: A descriptive analysis of all research variables

	Mean	Std. Deviation
Innovation dimensions	4.38	
Product innovation (PI)	4.44	
PI_1: The hotel increases the novelty of its products	4.5	.76
PI_2: The hotel products combined a new kind of technological know-how	4.3	.69
PI_3: The hotel constantly develops its services and products	4.6	.88
PI_4:The specifications of hotel products are always varied	4.1	.79
PI_5: The hotel has a competitive advantage concerning new products	4.7	.88
Process innovation (PR)	4.35	
PR_1: The hotel outperforms the competitors in terms of production procedures	4.4	.78
PR_2: The hotel has fast and efficient production processes	4.3	.76
PR_3: The hotel applies innovative methods in production procedures	4.6	.69
PR_4: The hotel enjoys a high rate of modifications and development in methods and technologies	4.1	.88
Organizational innovation (OI)	4.48	
OI_1: The hotel vigorously explores innovative ideas	4.7	.76
OI_2: The hotel applies computer-based management systems	4.7	.69
OI_3: The hotel revamps its food supply chain management systems	4.5	.88
OI_4: The hotel renovates the organizational structure related to business cooperation	4.3	.79
OI_5: The hotel has a set of processes to carry out innovative activities	4.2	.88
Marketing innovation (MI)	4.28	
MI_1: The hotel initiates new pricing methods	4.6	.76
MI_2: The hotel uses new promotional methods for its products	4.4	.69
MI_3: The hotel revamps the design of existing and/or new products	4.1	.89
MI_4: The hotel initiates new distribution channels for its services and products	4.2	.80
MI_5: The hotel renovates its marketing activities	4.1	.85
Environmental uncertainty	4.35	
Competitive environmental uncertainty (CEU)	4.36	
CEU_1: The hotel has fierce competition	4.7	.79
CEU_2: The hotel "promotion wars" are currently raging	4.4	.69
CEU_3: Competitors offer things that are not easy to match	4.5	.82
CEU_4: The hotel has a competitive price advantage	4.3	.74
CEU_5: The hotel faces new competition very frequently	4	.88
CEU_6: The hotel has strong competitors	4.3	.73
Market environmental uncertainty (MEU)	4.41	
MEU_1: Customer desires and choices change over time	4.5	.76
MEU_2: Customers always seek new products and services	4.6	.69
MEU_3: Customers always strive to compare the prices of our hotel with others	4.3	.88

MEU_4: New customers are looking for different needs from existing customers	4.4	.79
MEU_5: The hotel caters to a different type of customer that we used to deal with in the past	4.5	.76
MEU_6: The hotel finds it difficult to predict any changes in the market	4.2	.81
Technological environmental uncertainty (TEU)	4.3	
TEU_1: The hotel is characterized by rapidly changing technology	4.5	.76
TEU_2: The hotel faces technological changes that create great opportunities	4.4	.79
TEU_3: The hotel finds it difficult to forecast the future of technology	4.6	.77
TEU_4: Technological changes bring new ideas	4.2	.79
TEU_5: Technological changes inside the hotel are rather rapid	4	.80
TEU_6: The hotel has frequent technological advancements	4.1	.76
Organizational agility	4.51	
The hotel can sense and anticipate changes in the market	4.8	.87
The hotel has flexibility in production methods and procedures	4.5	.76
The hotel can respond instantaneously to modifications in production processes and systems	4.8	.79
The hotel can react immediately to changes in customer demand due to its technological capabilities	4.7	.77
The hotel's strategic vision takes organizational agility into account to react to changes in the market	3.5	.79
The hotel maintains cooperative links with suppliers and consumers	4.6	.79
Hotel managers possess the expertise to manage change	4.6	.77
The hotel is well-equipped to meet or exceed customers' needs and expectations	4.5	.79
The hotel is well-equipped to provide products to consumers on time and to react promptly to changes in delivery requirements.	4.6	.76
The hotel can introduce a range of new products and services to the market quickly.	4.5	.76

In terms of innovation, Table (1) clearly illustrates that the total mean score of hotel innovation dimensions was 4.38. The results also revealed that innovation dimensions (i.e., product innovation, process innovation, organizational innovation, and marketing innovation) had high average mean scores of 4.44, 4.35, 4.48, and 4.28, respectively. This reveals a high level of all four types of hotel innovation. Similarly, these findings correspond with those of Chen (2019) and Sánchez *et al*. (2019). In addition, the results concur with those of Ravichandran (2018) who found that there is a very high level of firm innovativeness.

Relationship between environmental uncertainty, organizational agility, and hotel innovation dimensions

As shown in Table (2), the correlation was measured to explore the relationship between the variables of environmental uncertainty and hotel innovation dimensions. The findings indicated that there is a strong positive relationship between environmental uncertainty and the four dimensions of hotel innovation: PI (r= 0.82, Sig. <0.000); PR (r= 0.84, Sig. <0.000); OI (r= 0.79, Sig. <0.000); and MI (r= 0.81, Sig. <0.000). This means that if environmental uncertainty increases, hotel innovation dimensions will increase.

Table 2: Correlations between environmental uncertainty and innovation dimensions

		Product innovation
Environmental uncertainty	Pearson correlation Sig. (2-tailed) *N*	.82 .000 420
		Process innovation
Environmental uncertainty	Pearson correlation Sig. (2-tailed) *N*	.84 .000 420
		Organizational innovation
Environmental uncertainty	Pearson correlation Sig. (2-tailed) *N*	.79 .000 420
		Marketing innovation
Environmental uncertainty	Pearson correlation Sig. (2-tailed) *N*	.81 .000 420

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

The correlation was measured to explore the relationship between the variables of environmental uncertainty and organizational agility. Table (3) shows that there is a positive relationship between environmental uncertainty and hotel organizational agility (r= 0.87, Sig. <0.000). This means that if environmental uncertainty increases, hotel agility will increase. This result coincides with previous results which indicated that environmental uncertainty is positively related to organizational agility (Gligor *et al.,* 2016; Güner *et al.,* 2018).

Table 3: Correlation between environmental uncertainty and organizational agility (the mediating variable)

		Organizational agility
Environmental uncertainty	Pearson correlation Sig. (2-tailed) *N*	.87 .000 420

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

Moreover, the findings in Table (4) showed that there are strong positive relationships between organizational agility and the four dimensions of hotel innovation: PI (r= 0.80, Sig. <0.000); PR (r= 0.77, Sig. <0.000); OI (r= 0.82, Sig. <0.000); and MI (r= 0.84, Sig. <0.000). This means that if organizational agility increases, hotel innovation dimensions will increase. These results are supported by previous studies which found that agility was found to be positively associated with product innovation (Oke, 2013; Jangga *et al.,* 2015; Yildiz and Aykanat, 2021). In addition, ZareRavasan's (2021) results demonstrated that organizational agility is positively related to innovation performance. Moreover, organizational agility has a positive relationship with innovation capability (Saeed *et al.,* 2022).

Table 4: Correlation between organizational agility and innovation dimensions

		Product innovation
Organizational agility	Pearson correlation Sig. (2-tailed) *N*	.80 .000 420
		Process innovation
Organizational agility	Pearson correlation Sig. (2-tailed) *N*	.77 .000 420
		Organizational innovation
Organizational agility	Pearson correlation Sig. (2-tailed) *N*	.82 .000 420
		Marketing innovation
Organizational agility	Pearson correlation Sig. (2-tailed) *N*	.84 .000 420

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

Besides, Table (5) illustrates that there are moderate positive relationships between environmental uncertainty and the four dimensions of hotel innovation with organizational agility as a mediating variable: PI (r= 0. 24, Sig. <0.000); PR (r= 0.26, Sig. <0.000); OI (r= 0.21, Sig. <0.000); and MI (r= 0.23, Sig. <0.000). This means that if environmental uncertainty increases, hotel innovation dimensions will increase.

Table 5: Correlation between environmental uncertainty and innovation dimensions with organizational agility as a mediating variable

		Product innovation
Environmental uncertainty	Pearson correlation Sig. (2-tailed) *N*	.24 .000 420
		Process innovation
Environmental uncertainty	Pearson correlation Sig. (2-tailed) *N*	.26 .000 420
		Organizational innovation
Environmental uncertainty	Pearson correlation Sig. (2-tailed) *N*	.21 .000 420
		Marketing innovation
Environmental uncertainty	Pearson correlation Sig. (2-tailed) *N*	.23 .000 420

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

Regression results of environmental uncertainty and organizational agility with hotel innovation dimensions

Tables (6), (7), and (8) show that three multiple regression analyses were used to assess: (1) the direct effect of environmental uncertainty on the dimensions of hotel innovation; (2) the impact of environmental uncertainty on organizational agility, and (3) the influence of environmental uncertainty on hotel innovation dimensions with organizational agility as a mediating variable. Thus, the method of Baron and Kenny (1986) was used to test mediation.

As illustrated in Table (6), the first regression analysis revealed that environmental uncertainty was found to positively influence the four dimensions of hotel innovation [i.e., PI (R-square=.83, P-value=.000); PR (R-square =.85, P-value=.000); OI (R-square=.80, P-value=.000); MI (R-square=.82, P-value=.000)]. Based on these regression results, hypotheses 1, 2, 3, and 4 were supported. These results concur with prior studies which found that environmental uncertainty has a positive and direct relationship with innovation capability (Mandal, 2016; Mukherji and Mukherji, 2017; Saeed *et al.,* 2022). However, these findings are inconsistent with previous researchers (e.g., Köseoglu *et al.,* 2013; Jahanshahi, 2016; Yu *et al.,* 2016; Yan and Yan, 2017) who argued that innovation is negatively influenced by market and competitive uncertainty. In addition, these findings are not in agreement with those of Darvishmotevali *et al.,* (2020) which showed that market uncertainty and competitive uncertainty have a negative effect on organizational creativity.

Table 6: Environmental uncertainty influencing hotel innovation dimensions

EU	**Un-standardized coefficients**			**Sig.**	**Model statistics**
	B	Std. Error	R-square	.000	*F: 9.0784*
Constant	.011	.000		.000	
PI	.020	.002	.83	.000	
PR	.033	.000	.85	.000	
OI	.021	.004	.80	.000	
MI	.015	.001	. 82	.000	

Regression equation can be formed as EU=.011+.02 PI+.033 PR+ 021 OI +.015 MI

As shown in Table (7), the second regression analysis showed that EU has a strong positive impact on organizational agility (R-square =.88, P-value=.000). This finding is consistent with Gligor *et al.* (2016) who found that environmental uncertainty is a positive impact on agility but with supply chain orientation and market orientation as mediators in the relationship**.** Also, this finding is in agreement with those of Mukherji and Mukherji (2017), who found that the EU drives businesses to seek alternatives through innovation Similarly, James and George (2018) found that the EU significantly influences agile practices. Furthermore, Güner *et al.* (2018) found that technological uncertainty has a positive effect on agility. In addition, Ehtesham Rasi *et al.* (2019) confirmed that the EU indirectly influences agility. Besides, agile manufacturing was found to be positively affected by the EU (Inman and Green, 2021).

Table 7: Environmental uncertainty influencing organizational agility (the mediating variable)

EU	**Un-standardized coefficients**			**Sig.**	**Model statistics**
	B	Std. Error	R-square	.000	*F: 12.0135*
Constant	.004	.001		.000	
Organizational agility	.011	.004	. 88	.000	

The regression equation can be formed as environmental uncertainty = .004+ .011 organizational agility

The third regression analysis (see Table 8) was performed to investigate the impact of environmental uncertainty on hotel innovation dimensions with organizational agility as a mediating variable. This analysis revealed that the four dimensions of hotel innovation were found to be positively influenced by organizational agility [i.e., PI (R-square=.81, P-value=.000); PR (R-square =.78, P-value=.000); OI (R-square=.82, P-value=.000); MI (R-square=.85, P-value=.000)]. In this regard, several researchers (e.g., Khin *et al.,* 2012; Oke, 2013; Jangga *et al.*, 2015) found that a firm's agility predicts the firm's product innovativeness. Additionally, Nielsen and Momeni (2016) proposed that organizational agility has a direct effect on innovation capability. Moreover, agility was found to positively influence organizational innovation (Saeed *et al.*, 2022).

Table 8: Environmental uncertainty (EU) influencing hotel innovation dimensions with organizational agility (OA) as a mediating variable

	Un-standardized coefficients												Sig.	Model statistics
	B				**Std. Error**				**R-Square**					
Variables	PI	PR	OI	MI	PI	PR	OI	MI	PI	PR	OI	MI		
Constant	.012	.010	.000	.015	.000	.014	.011	.012						
OA	.022	.013	.018	.019	.011	.004	.001	.001	.81	.78	.82	.85	.000	F:14.0344
EU	.000	.011	.005	.000	.001	.011	.010	.000	.24	.27	.23	.23		

Regression equation can be formed as **OA** = .001 + .022 **PI** +.013 **PR** + .018 **OI** +.019 **MI**
Regression equation can be formed as **EU** = .001+ .012 **PI** +.010 **PR** + .000 **OI** +.015 **MI**
PI: product innovation; **PR**: process innovation; **OI** organizational innovation; **MI**: marketing innovation

As shown in Table (8), the third regression analysis also showed that EU no longer significantly influences hotel innovation dimensions [i.e., PI (R-square=.24, P-value=.000); PR (R-square =.27, P-value=.000); OI (R-square=.23, P-value=.000); MI (R-square=.23, P-value=.000)].

Depending on regression results in tables (6), (7), and (8), Baron and Kenny's (1986) three conditions were met as follows:

(1) Regarding the first condition, environmental uncertainty as an independent variable was found to positively influence hotel innovation dimensions (the dependent variable) in the first regression equation.

(2) As regards the second condition, environmental uncertainty was found to positively influence organizational agility (the mediator) in the second regression equation.

(3) Concerning the third condition, when the independent variable (hotel innovation dimensions) and the mediator (organizational agility) were simultaneously entered into the third regression model, hotel agility was found to positively influence the hotel innovation dimensions. Additionally, environmental uncertainty (the independent variable) no longer significantly affects hotel innovation dimensions (the dependent variable).

The previous results confirmed the full mediating role of hotel agility on the relationship between environmental uncertainty and the three dimensions of innovation in five-star hotels. Therefore, hypotheses 5, 6, 7, and 8 were supported. These findings showed that if the EU increases organizational agility, then

organizational innovation dimensions will be influenced as well. These results are consistent with those of Puriwat and Hoonsopon (2021) as well as Saeed *et al.* (2022) who claimed that organizations with agility in their strategies, structures, and processes are capable of innovating or modifying products, services, and technologies in response to changes in the external environment around them.

Conclusion and implications

The main objectives of this research were two-fold: First, investigating the impact of environmental uncertainty on different types of innovation (product, process, organizational, and marketing) in hotels, and second, examining the role of organizational agility as a mediator between environmental uncertainty and innovation dimensions. The study shed light on three main findings: (1) EU positively influences the four dimensions of hotel innovation, (2) organizational agility plays a fully mediating role in the relationship between environmental uncertainty and innovation dimensions in five-star hotels, and (3) hotels are acutely aware of the dynamism and complexity of external factors in the tourism environment, such as the constant changes in the market, technological, and competitive environment.

This study theoretically contributed to the literature on the three variables of the research (environmental uncertainty, agility, and innovation) in the context of hospitality in three different ways. First, the results of the study achieved a deeper understanding of the concepts of the aforementioned variables in hotels. Secondly, the results highlighted the importance of the mediating role of agility in the relationship between environmental uncertainty and innovation in hotels. Thirdly, the research on EU, agility, and innovation was also expanded to include Egyptian hotels.

Practically, this study could be beneficial for hotel practitioners in the following:

(1) Hotel practitioners should take into account the theoretical and practical relationship between environmental uncertainty, agility, and innovation. Therefore, they should keep up the high level of all four types of hotel innovation by maintaining good agility practices in hotels. In practice, top management should support and encourage creativity and innovation in hotels by setting a motivational policy for employees with innovative ideas. Also, hotels should have a good strategic vision that puts more emphasis on the need for agility to respond to market changes

(2) The findings asserted the mediating role of agility and showed that highly agile hotels are more willing to be involved in different types of innovation in a highly uncertain environment. Thus, hotels should also explore and exploit new and existing opportunities in an uncertain environment. Furthermore, they should make agility a key component of their competitive strategy.

(3) Hotel operators or owners should continue to work on improving investment in technological capabilities and human capital. They should also develop human resources skills, experiences, capabilities, and knowledge so that they are more able to deal with the continuous changes in the tourism work environment and its challenges.

(4) The results emphasized that the external environment of hotels is highly uncertain, dynamic, and complex. Therefore, hotel managers should focus on the components of environmental uncertainty (e.g., the constant changes in the market, and the technological and competitive environment). This helps them to make better strategic and tactical decisions regarding potential risks and to make contingency plans.

(5) The goals of hotels and their management are influenced by the amount as well as the sources of environmental uncertainty (e.g., clients, wholesalers, and suppliers). Therefore, hotel practitioners should carefully analyze these sources before selecting the appropriate strategy (such as a conservative strategy) to successfully cope with the different types of environmental uncertainty, e.g., market shocks and fierce market competition (Chen *et al*., 2022).

Limitations and avenues for future research

The study has several limitations as well as avenues for further studies. First, this research was undertaken in a single city and industry which may constrain the generalization of the research results. Further research could extend the research on the relationship between EU, agility, and innovation to other cities in Egypt (such as Sharm El Sheikh and Hurghada) and other hospitality settings (e.g. restaurants) to generalize the findings of the research. Second, this research focused on the impact of environmental uncertainty on four types of hotel innovation (product innovation; process innovation; organizational innovation; marketing innovation) that do not include workforce innovation. Therefore, future studies could also determine the impact of environmental uncertainty on hotel workforce innovation. In addition, they can use employee agility as a mediator or mediator rather than organizational agility. Third, assessing the role of agility as a mediator is very limited in the literature, thus limiting any comparison of the study results with those of other studies. Fourth, the research investigated the role of organizational agility as a mediator. Thus, further studies could examine the effect of organizational agility as a moderating variable on the relationship between the EU and innovation in hotels. Fifth, the research only addressed the mediating role of organizational agility. Further research could also assess the role of customer agility as a mediator or moderator as it enables the company to take advantage of customer voices to gain market information and discover competitive business opportunities, thus allowing the company to survive and thrive (Giacosa *et al*., 2022). Sixth, the data was collected by questionnaire, and therefore future studies can conduct other methods of data collection (e.g., interviews with hotel managers and supervisors) to confirm the research results as well as to gain more depth and rich data on the topic of study. Finally, the research results cannot be generalized as the convenience sampling method was used and the sample was chosen from managers and supervisors working in five-star hotels in one city in Egypt.

References

- Abrishamkar, M. M., Abubakar, Y. A., & Mitra, J. (2021). The influence of workforce agility on high-growth firms: The mediating role of innovation. *The International Journal of Entrepreneurship and Innovation*, 22, 3, 146-160.
- Ali, Z., Zwetsloot, I. M., & Nada, N. (2019). An empirical study to explore the interplay of Managerial and Operational capabilities to infuse organizational innovation in SMEs. *Procedia Computer Science*, 158, 260-269.
- Al-Qaralleh, R. E. & Atan, T. (2022). Impact of knowledge-based HRM, business analytics and agility on innovative performance: linear and FsQCA findings from the hotel industry. *Kybernetes*, 51, 1, 423-441.
- Anderson, P., & Tushman, M. L. (2018). Technological discontinuities and dominant designs: A cyclical model of technological change. In *Organizational Innovation* (pp. 373-402). Milton Park, UK: Routledge.

- Annosi, M. C., Mattarelli, E., Micelotta, E., & Martini, A. (2022). Logics' shift and depletion of innovation: A multi-level study of agile use in a multinational telco company. *Information and Organization*, *32*, 3, 100421.
- Asil, A. (2019). Design and implementation of strategic agility evaluation model with a structural equation modelling approach. *Academy of Strategic Management Journal*, 18, 1, 1-16.
- Baba, M., Mahmood, R., & Halipah, A. (2017). The moderating role of environmental turbulence on the relationship between organizational learning and firm innovativeness. *International Journal of Management Research and Reviews*, 7, 2, 148-159.
- Baron, R. M., & Kenny, D. A. (1986) Moderator-mediator variables distinction in social psychological research: conceptual, strategic, and statistical consideration. *Journal of Personality and Social Psychology*, 51, 6, 1173-1182.
- Berg, V., Birkeland, J., Nguyen-Duc, A., Pappas, I. O., & Jaccheri, L. (2020). Achieving agility and quality in product development-an empirical study of hardware startups. *Journal of Systems and Software*, *167*, 110599.
- Buhalis, D., & Sinarta, Y. (2019). Real-time co-creation and nowness service: Lessons from tourism and hospitality. *Journal of Travel & Tourism Marketing*, 36, 5, 563-582.
- Chen, C.-J. (2019). Developing a model for supply chain agility and innovativeness to enhance firms' competitive advantage. *Management Decision*, 57, 7, 1511-1534
- Chen, J., Shu, W., Wang, X., Sial, M. S., Sehleanu, M., & Badulescu, D. (2021). The Impact of Environmental Uncertainty on Corporate Innovation: Empirical Evidence from an Emerging Economy. *International Journal of Environmental Research and Public Health*, 19, 1, 334.
- Christofi, M., Pereira, V., Vrontis, D., Tarba, S., & Thrassou, A. (2021). Agility and flexibility in international business research: A comprehensive review and future research directions. *Journal of World Business*, 56, 3, 101194.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. London: Sage Publications.
- Cyfert, S., Szumowski, W., Dyduch, W., Zastempowski, M., & Chudziński, P. (2022). The power of moving fast: responsible leadership, psychological empowerment and workforce agility in energy sector firms. *Heliyon*, *8*, 10.
- Darvishmotevali, M., Altinay, L., & Köseoglu, M. A. (2020). The link between environmental uncertainty, organizational agility, and organizational creativity in the hotel industry. *International journal of hospitality management*, *87*, 102499.
- Donate, M. J., González-Mohíno, M., Appio, F. P., & Bernhard, F. (2022). Dealing with knowledge hiding to improve innovation capabilities in the hotel industry: The unconventional role of knowledge-oriented leadership. *Journal of Business Research*, 144, 572-586.
- Egyptian Hotel Association. (2021). Egyptian hotel guide. 39th edition, Cairo: EHA Press.
- Ehtesham Rasi, R., Abbasi, R., & Hatami, D. (2019). The Effect of Supply Chain Agility Based on Supplier Innovation and Environmental Uncertainty. *International Journal of Supply and Operations Management*, 6, 2, 94-109.
- Fincham, J. (2008). Response Rates and Responsiveness for Surveys, Standards, and the Journal. *American journal of pharmaceutical education*, 72, 2.
- Findsrud, R. (2020). An Agile Approach to Service Innovation: Creating Valuable Service Innovation with Agile Resource Integration. *Journal of Creating Value*, 6 (2), 190-207.
- Ganter, A., & Hecker, A. (2013). Deciphering antecedents of organizational innovation. *Journal of Business Research*, 66, 5, 575-584.
- Giacosa, E., Culasso, F., & Crocco, E. (2022). Customer agility in the modern automotive sector: how lead management shapes agile digital companies. *Technological Forecasting and Social Change*, *175*, 121362.
- Gligor, D. M., Holcomb, M. C., & Feizabadi, J. (2016). An exploration of the strategic antecedents of firm supply chain agility: the role of a firm's orientations. *International Journal of Production Economics*. 179, 1, 24-34.

- Gligor, D., Holcomb, M., Maloni, M. J., & Davis-Sramek, E. (2019). Achieving financial performance in uncertain times: leveraging supply chain agility. *Transportation Journal*, *58*, 4, 247-279.
- Güner, H. M., Çemberci, M., & Civelek, M. E. (2018). The effect of supply chain agility on firm performance. *Journal of International Trade, Logistics and Law*, 4, 2, 25-34.
- Hadjielias, E., Christofi, M., Christou, P., & Drotarova, M. H. (2022). Digitalization, agility, and customer value in tourism. *Technological Forecasting and Social Change*, *175*, 121334.
- Harif, M. A. A. M., Nawaz, M., & Hameed, W. U. (2022). The role of open innovation, hotel service quality and marketing strategy in hotel business performance. *Heliyon*, e10441.
- Holzner, B., & Wagner, M. (2022). Linking levels of green innovation with profitability under environmental uncertainty: An empirical study. *Journal of Cleaner Production*, 134438.
- Hoonsopon, D., & Ruenrom, G. (2012). The impact of organizational capabilities on the development of radical and incremental product innovation and product innovation performance. *Journal of Managerial Issues*, 4, 3, 250-276.
- Hussain, M., & Malik, M. (2022). How do dynamic capabilities enable hotels to be agile and resilient? A mediation and moderation analysis. *International Journal of Hospitality Management*, 106, 103266.
- Inman, R. A., & Green, K. W. (2021). Environmental uncertainty and supply chain performance: the effect of agility. *Journal of Manufacturing Technology Management*, 33, 2, 239-258.
- Jahanshahi, A. (2016). Disentangling the emergence of perceived environmental uncertainty among technology entrepreneurs. *Kybernete*s , 45, 6, 962-976.
- James, N., & George, R. (2018). Exploring the influence of Environmental Uncertainty and Supply chain practices A Quarterly. *SCMS Journal of Indian Management*, *15*, 4, 22-31.
- Jangga, R., Ali, N. M., Ismail, M., & Sahari, N. (2015). Effect of environmental uncertainty and supply chain flexibility towards supply chain innovation: An exploratory study. *Procedia Economics and Finance*, *31*, 262-268.
- Kafetzopoulos, D., Psomas, E., & Skalkos, D. (2020). Innovation dimensions and business performance under environmental uncertainty. *European Journal of Innovation Managemen*t, 23, 5, 856-876.
- Kale, E., Aknar, A., & Başar, Ö. (2019). Absorptive capacity and firm performance: The mediating role of strategic agility. *International Journal of Hospitality Management*, *78*, 276-283.
- Kazancoglu, I., Ozbiltekin-Pala, M., Mangla, S. K., Kazancoglu, Y., & Jabeen, F. (2022). Role of flexibility, agility and responsiveness for sustainable supply chain resilience during COVID-19. *Journal of Cleaner Production*, 132431.
- Khin, S., Ahmad, N. H., & Ramayah, T. (2012). The integrated effect of strategic orientations on product innovativeness: moderating role of strategic flexibility. *Procedia-Social and Behavioral Sciences*, 65, 743-748.
- Köseoglu, M. A., Topaloglu, C., Parnell, J. A., & Lester, D. L. (2013). Linkages among business strategy, uncertainty and performance in the hospitality industry: Evidence from an emerging economy. *International Journal of Hospitality Management*, *34*, 81-91.
- Koskela-Huotari, K., Edvardsson, B., Jonas, J. M., Sörhammar, D., & Witell, L. (2016). Innovation in service ecosystems—Breaking, making, and maintaining institutionalized rules of resource integration. *Journal of Business Research*, 69, 8, 2964-2971.
- Kowalczyk, D. (2015). Convenience sample: example and definition. Retrieved July 10, 2022, from http://study.com
- Laguir, I., Gupta, S., Bose, I., Stekelorum, R., & Laguir, L. (2022). Analytics capabilities and organizational competitiveness: Unveiling the impact of management control systems and environmental uncertainty. *Decision Support Systems*, *156*, 113744.
- Lee, C., Pung, J. M., & Del Chiappa, G. (2022). Exploring the nexus of tradition, modernity, and innovation in restaurant SMEs. *International Journal of Hospitality Management*, *100*, 103091.
- Liu, H.-M. & Yang, H.-F. (2019). Network resource meets organizational agility: creating an idiosyncratic competitive advantage for SMEs. *Management Decision*, 58, 1, 58-75.

- Mandal, S. (2016). An empirical competence-capability model of supply chain innovation. *Business: Theory and Practice*, *17*, 2, 138-149.
- Manurung, A. H., & Kurniawan, R. K. (2021). Organizational agility: do agile project management and networking capability require market orientation. *International Journal of Managing Projects in Business*, 15, 1, 1-35.
- Menguc, B., Auh, S., & Yannopoulos, P. (2014). Customer and supplier involvement in design: The moderating role of incremental and radical innovation capability. *Journal of Product Innovation Management*, *31*, 2, 313-328.
- Menon, S., & Suresh, M. (2021). Factors influencing organizational agility in higher education. *Benchmarking: An International Journal*, 28, 1, 307-332.
- Messabia, N., Fomi, P. R., & Kooli, C. (2022). Managing restaurants during the COVID-19 crisis: Innovating to survive and prosper. *Journal of Innovation & Knowledge*, *7*, 4, 100234.
- Mukherji, A., & Mukherji, J. (2017). Environmental uncertainty and positive performance of small firms: the role of key mediators. *Journal of Organizational Psychology*, 17, 3, 24-39.
- Nandakumar, M. K., Jharkharia, S., & Nair, A. (2012). Environmental Uncertainty and Flexibility. *Global Journal of Flexible Systems Management*, 13, 3, 121-122.
- Nielsen, S. B., & Momeni, M. (2016). Structural capability of an organization toward innovation capability. *Journal of Management Research*, *8*, 2, 86-102.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. 3rd edition. New York, NY: McGraw-Hill.
- Oke, A. (2013). Linking manufacturing flexibility to innovation performance in manufacturing plants. *International Journal of Production Economics*, *143*, 2, 242-247.
- Oke, A., Walumbwa, F., & Myers, A. (2012). Innovation Strategy, Human Resource Policy, and Firms' Revenue Growth: The Roles of Environmental Uncertainty and Innovation Performance. *Decision Sciences*, 43, 2.
- Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. Milton Park, UK: Routledge.
- Panda, S., & Rath, S. K. (2018). Strategic IT-business alignment and organizational agility: from a developing country perspective. *Journal of Asia Business Studies*, 12, 4, 522-440.
- Pashutan, M., Abdolvand, N., & Harandi, S. R. (2022). The impact of IT resources and strategic alignment on organizational performance: The moderating role of environmental uncertainty. *Digital Business*, *2*, 2, 100026.
- Prajogo, D. I., & Hong, S. W. (2008). The effect of TQM on performance in R&D environments: a perspective from South Korean firms. *Technovation*, 28, 2, 855-863.
- Puriwat, W., & Hoonsopon, D. (2021). Cultivating product innovation performance through creativity: the impact of organizational agility and flexibility under technological turbulence. *Journal of Manufacturing Technology Management*, 33, 4, 741-762.
- Ramirez, F. J., Parra-Requena, G., Ruiz-Ortega, M. J., & Garcia-Villaverde, P. M. (2018). From external information to marketing innovation: the mediating role of product and organizational innovation. *Journal of Business & Industrial Marketing*, 33, 5, 693-705.
- Ravichandran, T. (2018). Exploring the relationships between IT competence, innovation capacity and organizational agility. *Journal of Strategic Information Systems*, 27, 22-42.
- Sadeghi, S., Akbarpour, A., & Abbasianjahromi, H. (2022). Provide a Lean and Agile Strategy for an Antifragile Sustainable Supply Chain in the Construction Industry (residential complex). *Cleaner Logistics and Supply Chain*, *5*, 100079.
- Saeed, M., Tabassum, H., Zahid, M., Jiao, Y., & Nauman, S. (2022). Organizational Flexibility and Project Portfolio Performance: The Roles of Environmental Uncertainty and Innovation Capability. *Engineering Management Journal*, 34, 2, 249-264.
- Sánchez, A. M., Pérez-Pérez, M., & Vicente-Oliva, S. (2019). Agile production, innovation and technological cooperation: Overlapping priorities of manufacturing firms. *Baltic Journal of Management*, 14, 4, 597-615.

- Shahin, A., Barati, A., Dabestani, R., & Khalili, A. (2017). Determining factors influencing radical and incremental innovation with a case study in the petrochemical industry. *International Journal of Business Innovation and Research*, 12, 1, 62-79.
- Shamim, S., Yang, Y., Zia, N., & Shah, M. (2021). Big data management capabilities in the hospitality sector: Service innovation and customer generated online quality ratings. *Computers in Human Behavior*, 2, 3, 15-19.
- Sharma, A., Shin, H., Santa-María, M. J., & Nicolau, J. L. (2021). Hotels' COVID-19 innovation and performance. *Annals of Tourism Research*, 88, 103180.
- Shin, H., & Perdue, R. R. (2022). Developing creative service ideas through hotel customer engagement for open innovation: Focused on empowerment and motivation processes. *International Journal of Hospitality Management*, *100*, 103077.
- Sjödin, D., Parida, V., Kohtamäki, M., & Wincent, J. (2020). An agile co-creation process for digital servitization: A micro-service innovation approach. *Journal of Business Research, 112*, 478-491.
- Škare, M., & Soriano, D. R. (2021). A dynamic panel study on digitalization and firm's agility: What drives agility in advanced economies 2009–2018. *Technological Forecasting and Social Change*, 163, 120418.
- Vecchiato, R. (2015). Creating value through foresight: first move advantages and strategic agility. *Technological Forecasting and Social Change*, 101, 25-36.
- Wang, C., & Ahmed, A. (2004). The development and validation of the organizational innovativeness construct using confirmatory factor analysis. European *Journal of Innovation Management*, 7, 4, 303-313.
- Wang, M. C., & Fang, C. S. (2012). The moderating effect of environmental uncertainty on the relationship between network structures and the innovative performance of a new venture. *Journal of Business & Industrial Marketing*, 27, 4, 311-323.
- Wang, R. J., Malthouse, E. C., & Krishnamurthi, L. (2015). On the go: how mobile shopping affects customer purchase behavior. *Journal of Retailing and Consumer Services*, 91, 2, 217-234.
- Weber, Y., & Tarba, S. Y. (2014). Strategic agility: a state of the art introduction to the special section on strategic agility. *California Management Review*, 56, 3, 5-12.
- Yan, J., & Yan, L. (2017). Collective entrepreneurship, environmental uncertainty and small business performance: A contingent examination. *The Journal of Entrepreneurship*, *26*, 1, 1-26.
- Yildiz, T., & Aykanat, Z. (2021). The mediating role of organizational innovation on the impact of strategic agility on firm performance World Journal of Entrepreneurship. *Management and Sustainable Development*, 17, 4, 765-786.
- Yu, C. L., Wang, F., & Brouthers, K. D. (2016). Competitor identification, perceived environmental uncertainty, and firm performance. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, *33*, 1, 21-35.
- ZareRavasan, A. (2021). Boosting innovation performance through big data analytics: An empirical investigation on the role of firm agility. *Journal of Information Science*, 1-16.
- Zhang, D., Linderman, K., & Schroeder, R. (2012). The moderating role of contextual factors on quality management practices. *Journal of Operations Management*, 30, 1, 12-23.

الدور الوسيط للرشاقة التنظيمية في العلاقة بين عدم اليقين البيئي والابتكار في الفنادق

ياسر عبد العاطي[1] هيثم دراز[2]

[1]قسم إدارة الفنادق – كلية السياحة والفنادق – جامعة مدينة السادات

[2]قسم إدارة الفنادق – معهد سيناء العالي للسياحة والفنادق

تؤدي الرشاقة التنظيمية إلى العديد من النتائج الإيجابية للفنادق، مثل التكيف مع بيئة متقلبة وغير مؤكدة وديناميكية، وزيادة جودة المنتج أو الخدمة، إلخ. بالإضافة إلى ذلك، أصبحت الرشاقة التنظيمية ضرورية للابتكار بأنواعه المختلفة. ونظرًا لأن الرشاقة أمر بالغ الأهمية بالنسبة للفنادق، فمن المهم جداً أن يكونوا على دراية بآثارها. وبالتالي، هدفت هذه الدراسة إلى تحديد درجة عدم اليقين البيئي (environmental uncertainty) في الفنادق وتقييم الرشاقة التنظيمية والابتكار في الفنادق؛ وقياس مدي تأثير عدم اليقين البيئي على أبعاد الابتكار المختلفة؛ وأخيراً دراسة تأثير الرشاقة كمتغير وسيط على العلاقة بين عدم اليقين البيئي والابتكار في الفنادق. ولتحقيق هذه الأهداف، اشتمل مجتمع الدراسة على مديري الأقسام والمشرفين في فنادق الخمس نجوم بالقاهرة الكبرى. وتم أخذ عينة ملائمة لتحقيق أهداف هذا البحث، حيث تم توزيع 480 استمارة استقصاء على العينة. وكانت الاستمارات الصالحة للتحليل 420، بمعدل استجابة 87.5 في المائة. ولتحليل هذه الاستمارات إحصائياً، تم استخدام التحليل الوصفي، وتحليل الارتباط، وتحليل الانحدار المتعدد. وأظهرت نتائج البحث أن عدم اليقين البيئي له تأثير إيجابي على الأبعاد الأربعة للابتكار الفندقي (أي ابتكار المنتجات، وابتكار العمليات، والابتكار التنظيمي، والابتكار التسويقي). بالإضافة إلى ذلك، بينت النتائج أن الرشاقة التنظيمية تتوسط بشكل كامل تأثير عدم اليقين البيئي على الأبعاد الأربعة للابتكار الفندقي. ومن ثم، فقد تمت التوصية بضرورة استمرار الفنادق في الممارسات الجيدة للرشاقة التنظيمية.

الكلمات الدالة: الرشاقة التنظيمية، عدم اليقين البيئي، الابتكار.