




# The Risk Structure of Portuguese Tourism Industry Subsectors: A PLS-SEM Approach

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## ABSTRACT

This paper examines risk factors that affect the Portuguese tourism industry subsectors, namely, travel agencies and tour operators, leisure and recreation activities, and tourism events firms. Additionally, it also assesses the effect of these risks on strategic and operational responses in the tourism subsectors mediated by a mitigation dimension. In terms of methodology, we used exploratory factor analysis (EFA) on data collected from 416 questionnaires distributed across the three tourism subsectors complemented by a Multigroup Analysis (MGA) via partial least squares structural equations modeling (PLS-SEM). The exploratory factor analysis confirmed distinct risk categories, including organizational, environmental, competitive, economic, political, infrastructure-related, circumstantial, business deficiencies, and specific (local) risks. Results documented the different risk impacts of risks on strategic and operational responses for tourism subsectors. While mitigation efforts do not significantly differ in their overall effects across subsectors, differences emerge in their direct effects. Concerning practical implications, this research provides insights for stakeholders in the tourism industry, supporting them with the knowledge to proactively understand, anticipate, and manage any risks in their operations, essential for boosting the resilience and competitive edge of the tourism subsectors in a global environment shrouded by uncertainty.

**Keywords:** Risk; Tourism Subsectors; SEM

**JEL Codes:** L83; Z31; D81

## I. Introduction

The tourism industry, a critical component of the global economy, is characterized by its vulnerability and risks that can significantly impact its operations and sustainability, including weather variability, climate change, natural disasters, terrorism, and political instability (Aliperti et al., 2019; Franzoni & Pelizzari, 2016; Yang & Nair, 2014; Zibanai, 2014). In the context of tourism, Bera et al. (2020) defined the risk of an enterprise as the risk of financial, reputational, and legal liability losses due to the lack of adaptation, viability, or reliability of processes or the lack of resources necessary for the firm's

operation caused by external and internal threats.

The tourism industry is susceptible to many risks (Okumus et al., 2005). For instance, in Latin America, the main risks are viruses and pests, natural hazards, critical infrastructure sabotage, public insecurity, and scandals and rumors (González Rodríguez & Acevedo-Navas, 2021). The U.S. travel and leisure industry is susceptible to oil price risk, with subsectors such as airlines, recreational services, restaurants, and bars significantly affected (Mohanty et al., 2014). The COVID-19 pandemic has further exacerbated the risks, with some subsectors, such as restaurants, events, and airlines, being more heavily impacted than others (Abdelsalam et al., 2023).

The risk categories affecting tourism industry subsectors are essential for countries where tourism plays a vital role in economic growth, such as Portugal. Risk perception creates different responses in the planning and operational actions of a businesses. The complexity and dynamic nature of risks in the tourism sector require a comprehensive understanding and effective management strategies. Thus, this study had a twofold objective. Firstly, it aims to categorize risks affecting tourism subsectors: travel agencies and tour operators, leisure and recreation activities, and tourism events firms. Secondly, it assesses the effect of risks on strategic and operational responses in the tourism subsectors mediated by a mitigation dimension.

For the purposes of this research, we employed exploratory factor analysis (EFA) to ascertain the types of risks that could affect the Portuguese tourism sector on data collected from 416 questionnaires distributed across three tourism subsectors. At the same time, we conducted a Multigroup Analysis (MGA) via partial least squares structural equations modeling (PLS-SEM).

Our analysis confirmed that Oroian and Ghere's (2012) risk framework can be extrapolated to other tourism subsectors. However, risks have different impacts on strategic and operational responses, according to tourism subsectors. Regarding the mediating effects from mitigation methods, no statistically significant difference among subsectors was exhibited when considering the overall effects. Nevertheless, some subsector heterogeneity stands out when addressing the direct effects. Results are helpful for decision-makers in understanding how to reduce the loss due to risks and handle the heterogeneity of the tourism industry.

Our study contributes to the existing literature by confirming specific risk categories in the tourism industry subsectors and proposing a mitigation risk framework. This framework is particularly relevant for intermediaries in the tourism sector, with clear implications globally.

Concerning the practical implications, this research offers insights for tourism industry stakeholders, enabling them to understand better, anticipate, and manage the inherent risks in their operations. This proactive approach to risk management is essential for enhancing the resilience and competitiveness of the tourism sector in a global environment increasingly shrouded and uncertain.

The remainder of the paper is structured as follows: in Section II, we discuss the relevant literature and devise the research questions; in Section III, we describe the data and the empirical approach used; in Section IV, we present the results; and in Section V, we provide the concluding remarks.

## II. Literature Background and Research Questions

Previous research has underscored the multifaceted nature of risks in tourism, emphasizing, for example, environmental, economic, and political factors (Ritchie & Crouch, 2003). The findings of Franzoni and Pelizzari (2016), who focused on weather-related risks in the tourism industry, emphasized the importance of environmental factors. González-Rodríguez and Acevedo-Navas (2021) highlighted various risks in the Latin American tourism sector, particularly economic and political risks. Mawby (2014) highlights the significant impact of crime and disorder on tourism, which can deter tourists and harm the industry.

Additionally, it is necessary to develop a dynamic risk management model for adaptive strategies in tourism (Kozak et al., 2007). This approach is crucial given the rapid changes in the global context evidenced by the impacts of events like the COVID-19 pandemic on the tourism industry (Gössling et al., 2020).

Earlier models provided structured frameworks for managing risks in, for example, travel agencies and small to medium-sized travel firms (e.g., Mingqi, 2015; Nasr, 2017; Oroian & Gheres, 2012). However, there is a need for models introducing adaptability by allowing tourism subsectors to customize risk categories based on their specific context. This flexibility is crucial in a dynamic industry like tourism, where risks are constantly evolving.

The tourism industry is susceptible to many risks (Aliperti et al., 2019). At the same time, it is an industry with different types of firms, such as tour operators, hotels, agencies, attractions, and festivals. They are concerned about risk management to reduce potential losses, although different risk factors can affect their strategic planning (Hamm & Su, 2021).

Oroian and Gheres (2012) developed a framework with nine dimensions of risks to the tourism sector: organizational, environmental, competitiveness, economic, political, infrastructure, circumstantial, business insufficiencies, and specific (local) risks. This framework was validated in the context of the travel agencies, but the authors suggested that it could be extrapolated to all intermediaries in tourism. Bearing that in mind, we proposed the following research question:

*RQ1: Is the Oroian and Gheres (2012) risk framework applicable to different subsectors of the tourism industry?*

The COVID-19 pandemic, as discussed by Gössling et al. (2020), and Zenker and Kock (2020), brought to light new risk categories in tourism, particularly related to health crises and the resultant economic disruptions. These risks have profoundly impacted tourism subsectors, which need to reevaluate risk management strategies. Additionally, geopolitical risks, such as those explored by Lee et al. (2021) and Demiralay and Kilincarslan (2019), add another layer of complexity, influencing travel patterns and destination choices. These recent developments highlight the need for tourism subsectors to consider a broader spectrum of risks, including pandemics and geopolitical shifts, in their risk management models.

Ritchie and Jiang (2019) pointed out that there are three groups of studies on risk in tourism, which are related to: 1) related to preparedness and planning, i.e., a management proactive response; 2) related to response to recovery, i.e., the sectorial strategies and actions adopted by firms; 3) related to resolution and reflection, i.e., what the sector learns from the crisis. The authors also highlighted that most studies focus on group 2.

Risks influence both the decisions of tourists and managers. Wang and Ritchie (2012) emphasized that it is managers' risk perceptions that determine planning strategies and, therefore, business responses to a crisis. The magnitude of the crisis, in relation to the firms, depends on risk management, generating different responses that vary according to the events and the degrees of uncertainty generated in the tourism subsectors (Backer & Ritchie, 2017). These responses are firm strategies implemented to minimize or recover from the negative impacts of imminent risks.

There is some literature available on risks and crises experienced by small and medium-sized enterprises (SMEs) in the tourism industry, although effective risk management is more frequent in large firms (Cushnahan, 2012). Most tourism SMEs do not have risk management planning in place, and sometimes, they do not implement strategies or actions to respond to the crisis due to the lack of resources and knowledge (Hystad & Keller, 2008). Nevertheless, literature concerned with the risks faced in the tourism industry is focused on specific sectors, for example, hotels (Okumus et al., 2005), travel agencies (Lee & Hyun, 2015; Oroian & Gheres, 2012), and event tourism (Hamm & Su, 2021). Few studies present models and empirical tests to establish frameworks (Ritchie & Jiang, 2019) or conduct comparative analyses between subsectors to provide insights covering the business diversity of the sector. Thus, we proposed a model to study the response of the tourism business to risks. We tested which Oroian and Gheres (2012) risk categories impact the strategic and operational responses of tourism firms. Furthermore, aligned with the diversity of the tourism industry, we propose identifying the different effects amongst two tourism subsectors. Thus, we proposed the following research questions:

*RQ2: Do risks affect the strategic response of tourism subsectors differently?*

*RQ3: Do risks affect the operational response of tourism subsectors differently?*

The susceptibility of tourism due to the wide range of external factors that can affect it (Okumus et al., 2005) is recognized by governments, destination management organizations (DMOs), and business associations that create public policies, programs, projects and publish guidelines for tourism subsectors to respond to different crises and catastrophes (Ritchie & Jiang, 2019). Risk mitigation is based on actions to reduce losses, as well as selecting and implementing methods, politics, and controls (Wijaya, 2021).

Bera et al. (2020) analyzed the mitigation actions implemented by EU Member States to reduce the negative effects of the COVID-19 pandemic on the tourism sector. Their analysis provided a framework that can be used to implement public policy and long-term strategy to prevent risk. Additionally, the role of business associations and DMOs in mitigating risks was studied by Paraskevas and Arendell (2007), demonstrating that DMOs play an active role in coordinating stakeholders' efforts in the face of threats and

risks, in addition to acting as catalysts for plans and policies to minimize losses in the sector.

Wang and Ritchie (2010) analyzed the influencing factors of crisis management planning in the hotel industry using the Onion Model of Strategic Crisis Planning (OMSCP). The authors recommended using the 4Rs spectrum: readiness, reduction/mitigation, response, and recovery. However, the industry often focuses on response and recovery issues and little attention is paid to mitigation and readiness, generating a reactive approach (Orchiston, 2013). It should be noted that mitigation is an element between the readiness of the business and its response to recovery.

In addition, Pforr (2009) highlighted that risk and crisis management in tourism is complex due to issues specific to its subsectors. Several studies point to a low capacity for planning and managing risks and crises of tourism firms despite the high exposure to risks characteristic of this industry (Lu & Law, 2006; Okumus et al., 2005; Orchiston, 2013; Ritchie & Jiang, 2019). In this context, mitigation actions can become highly important in the strategic and operational response of firms. Identifying the mitigating effects provides a better understanding of which mitigating actions must be implemented in risk management (Bera et al., 2020). In light of the above, we proposed verifying the mediating effect of mitigation actions on both the relationship between risk and strategic and operational responses.

*RQ4: How important are mitigating actions for mediating the strategic and operational responses to risk?*

### **III. Data Description and Empirical Approach**

Data for this research were collected from 416 questionnaires on the Portuguese tourism industry subsectors, namely, travel agencies and tour operators; leisure and recreation activities; and tourism events firms, with the following distribution by subsector, 221, 127, and 68, respectively.

The questionnaire, following the empirical approach of Oroian and Ghares (2012), is designed to identify the risks associated with the tourism industry subsectors, concerning their perceived impact on business. Additionally, it includes questions related to future strategies that firms in tourism subsectors intend to implement in the future to deal with unpredictable situations. Furthermore, there are questions related to the possible mitigation variables on the relationship between the perception of existing risks in the tourism subsectors and future decision-making regarding strategic planning and operational responses to be carried out in the future, such as state-support actions, business-related actions, and human resources-related actions.

The first section of the survey, which relates to the characterization of the firms to which the respondents belong, includes questions regarding the economic activity code, firm location (grouped by NUTS III regions), turnover (coded into 9 categories: 1) Less than €50,000; 2) €50,001-100,000; 3) €100,001-250,000; 4) €250,001-500,000; 5) €500,001-1,000,000; 6) €1,000,001-2,000,000; 7) €2,000,001-10,000,000; 8)

€10,000,001-50,000,000; and 9) more than €50,000,000), and the number of employees working full-time or part-time. Full-time employees were coded as: 1) one to four; 2) five to nine; 3) ten to nineteen; 4) twenty to twenty-nine; 5) fifty to two hundred and forty-nine; and 6) more than two hundred and fifty. Part-time employees were coded from one to five, where: 1) zero; 2) one to two; 3) three to five; 4) six to ten; and 5) more than ten. Finally, respondents were asked about their main subsector of tourism activity: leisure and recreation activities firms, travel agencies and tour operators' firms, and tourism events firms.

The second section relates to risk factors. Each question addresses a type of risk factor, and each risk factor of this typology is considered to be a variable, which is analyzed on a scale of one to five based on its intensity (1- very low and 5- very high). This section helps to identify the risks and difficulties that firms most frequently encounter in their operations. This section was based on risk factors identified by Oroian and Ghares (2012).

The third section discusses the mitigation measures taken by firms in a crisis, following those documented by Perl and Israeli, (2011). They are coded from one to five, based on the respondent's level of agreement (1- strongly disagree and 5- strongly agree), it evaluates eight variables: 1) employee layoffs; 2) reduction of working hours; 3) unpaid leave; 4) marketing campaigns; 5) price reductions; 6) charging for previously free services; 7) postponing payment deadlines; and 8) joining a network of firms within the subsector.

The fourth section focuses on mitigation measures taken by the state, with special attention to those implemented during the COVID-19 pandemic. This section facilitates an understanding of whether the support provided by the state in a crisis (COVID-19 pandemic) was useful and sufficient as a mitigating element to assist the analyzed tourism subsectors. It is divided into six variables: 1) employment subsidies; 2) loans and compensations; 3) tax credits; 4) tax deductions; 5) funds for marketing campaigns; and 6) others, assessed based on the respondents' answers. These variables are rated on a scale of one to five, according to their importance (1- not important and 5- very important). This section was developed based on the research of Blake and Sinclair's research (2003).

In the fifth section, the strategies that the tourism subsector firms intend to implement in the future to deal with unpredictable situations (strategic planning and operational responses) are examined. This section presents fifteen analysis variables: 1) preparing strategic forecasting plans; 2) developing contingency plans; 3) prioritizing tasks and actions to be taken; 4) analyzing various scenarios; 5) analyzing and mapping potential risks; 6) establishing a flexible work environment; 7) encouraging idea sharing; 8) promoting entrepreneurship; 9) investing in the decision-making process; 10) developing risk analysis, forecasting, and detection tools; 11) uniting and sharing ideas among competitors; 12) learning from past crisis experiences; 13) using media and marketing strategies in response to crisis; 14) identifying new market segments; and 15) collaborating with the local community. Each variable is rated on a scale of one to five according to its importance (1- not important and 5- very important). This section is supported by the work developed by Ritchie (2004).

The last section (6) addresses the sociodemographic characterization of the respondent and consists of eight questions: "age," which is coded as: 1) eighteen to twenty-four years old, 2) twenty-five to thirty-four years old, 3) thirty-five to forty-four years old, 4) forty-five to fifty-four years old, 5) fifty-five to sixty-four years old, and 6) sixty-five years or older old; "gender," coded with number one for female and two for male; "education level" offers ten coded options: 1) primary education, 2) lower secondary education, 3) upper secondary education, 4) secondary education, 5) vocational training, 6) short-cycle tertiary education, 7) bachelor's degree, 8) postgraduate diploma, 9) master's degree, and 10) doctorate; "training in Tourism," where the coding is zero if the respondent answers "no" and one if the respondent answers "yes"; "position," which is coded from one to six for the options of owner/president, general manager, commercial director, communications director, financial manager, and tourism animation technician, respectively; "years of experience," coded as follows: 1) one to two; 2) three to five; 3) six to ten; 4) eleven to twenty; and 5) more than twenty.

Data were handled with SPSS 29 and SmartPLS v.4.

## **IV. Results**

### **A. Characterization of the sample**

The current research diverged from the original study conducted by Oroian and Gheres (2012), which developed a scale for assessing risk management. Given the specific particularities of the Portuguese economic context, adjustments to several scale items were deemed necessary to ensure better alignment with the Portuguese reality.

An Exploratory Factor Analysis (EFA) was undertaken to assess and validate the constructs, thereby measuring the constituent elements of risk management. Additionally, the analysis aimed to determine if those components were maintained. Employing component analysis and the Varimax method, the EFA was conducted. Satisfactory outcomes were obtained from the Kaiser–Meyer–Olkin and Bartlett tests. Subsequently, individual EFAs were conducted for each factor (Kaiser–Meyer–Olkin > 0.5; Bartlett,  $p < 0.05$ ) (Pestana & Gageiro, 2014), as detailed in Table 1. Internal consistency analysis revealed that most of Cronbach's  $\alpha$  coefficients fell within the range of 0.6 to 0.9, indicating reliability levels spanning from poor to excellent (Pestana & Gageiro, 2014).

Table 1 illustrates that only Circumstantial risk and specific risk are completely similar to those derived from Oroian and Gheres (2012). Conversely, the remaining dimensions, namely organizational risk, environmental risk, competitiveness, economic risk, political risk, business insufficiencies, and infrastructural risk, exhibit substantial similarity to those delineated in Oroian and Gheres (2012).

The same procedures regarding the scales of mitigating actions and strategic planning and operational responses were implemented derived from Perl and Israeli (2011), Blake and Sinclair (2003), and Ritchie (2004).

**Table 1: Risk - Exploratory Factorial Analysis.**

Risk items and Factors	Factor Loadings	Mean value ± standard deviation KMO: Explained Variance	Cronbach alpha
<b>Factor 1 - Organizational risk (Internal business risk)</b>			
Lack of funding	0.655		
Theft/fraud in business by tourists	0.839	2.98±0.39	0.804
Lack of proper financial support	0.726	KMO: 0.715	
Unable to fulfill the needs of tourists	0.735		
Theft/fraud in business by staff	0.785		
<b>Factor 2 - Environmental (Nature)</b>			
Water pollution	0.905		
Air pollution	0.929	3.31±0.15	0.911
Fire	0.875	KMO: 0.822	
Natural disasters	0.844		
<b>Factor 3 - Competitiveness</b>			
The range of products belonging to competitors	0.801		
Distance from the main competitor	0.613	3.32±0.15	0.784
Prices of competitors	0.816	KMO: 0.809	
Technological changes e.g., reservation systems, new programs	0.751		
Too high prices in the tourism industry	0.699		
<b>Factor 4 - Economic risk</b>			
Decrease in disposable income	0.714		
Inflation	0.858	3.45±0.33	0.819
Interest rates	0.815	KMO: 0.738	
Currency fluctuations	0.833		
<b>Factor 5 - Political factors</b>			
Political instability in neighboring countries	0.843	3.62±0.19	0.710
Legislation	0.843	KMO: 0.639	
Safety/security	0.702		
<b>Factor 6 - Infrastructure</b>			
Appropriate equipment	0.795		
Quality infrastructure	0.742	3.62±0.24	0.698
Lack of qualified staff	0.640	KMO: 0.511	
Lack of experienced staff	0.718		
<b>Factor 7 - Circumstantial risk</b>			
Increased competition, internationally	0.776		
Increased competition, nationally	0.797	3.362±0.22	0.765
Lack of available time for tourism/leisure	0.734	KMO: 0.730	
Stress	0.759		
<b>Factor 8 - Business insufficiencies</b>			
Number of temporary personnel vs total number of personnel	0.733		
Urbanisation	0.708		
Crime in general	0.583	3.070±0.412	0.790
Amount of overtime worked by employees	0.706	KMO: 0.766	
Image of the country/destination	0.714		
Range of products is too limited	0.752		
<b>Factor 9 - Specific (local) risk</b>			
Insufficient marketing by local authorities	0.659		
Customer complaints	0.806	3.350±0.350	0.756
Carrying capacity and too many tourists/visitors	0.758	KMO: 0.741	
Diseases	0.726		
Seasonality	0.596		



The results of the EFA analysis conducted are shown in Table 2 and 3. Three factors clearly emerged from mitigation: human resources-related actions, business-related actions, and state-support actions. Two factors emerged from strategic planning: strategic response and operational response.

**Table 2: Mitigation - Exploratory Factorial Analysis.**

Mitigation items and Factors	Factor Loadings	Mean value ± standard deviation KMO: Explained Variance	Cronbach alpha
<b>Factor 1 – HR-related actions</b>			
Reduced working hours	0.748	2.51±0.49	0.610
Unpaid leave	0.757	KMO: 0.683	
Employee dismissal	0.683		
<b>Factor 2 – Business-related actions</b>			
Marketing campaigns	0.690	3.07±0.49 KMO: 0.683	0.597
Price reductions	0.702		
Charging for non-chargeable services	0.758		
Postponement of payment deadlines	0.714		
Association with a network of tourist entertainment companies or maritime-tourism operators	0.678		
<b>Factor 3 – State-support actions</b>			
Employability grants	0.690	3.48±0.47 KMO: 0.862	0.835
Loans and compensation	0.702		
Tax credits	0.758		
Tax deductions	0.694		
Funds for marketing campaigns	0.738		
Other	0.723		

**Table 3: Strategic and Operational Responses - Exploratory Factorial Analysis.**

Strategic Planning items and Factors	Factor Loadings	Mean value ± standard deviation KMO: Explained Variance	Cronbach alpha
<b>Factor 1 - Strategic Responses</b>			
Preparing strategic precision plans	0.768	3.88±0.06 KMO: 0.944	0.926
Prepare contingency plans	0.817		
Prioritize tasks and actions to be taken	0.804		
Analyzing various scenarios	0.814		
Analyzing and mapping possible risks	0.777		
Establishing an environment of flexibility in the company	0.662		
<b>Factor 2 - Operational responses</b>			
Encouraging employee training	0.690	3.93±0.13 KMO: 0.944	0.933
Encouraging the sharing of ideas	0.702		
Encouraging entrepreneurship	0.758		
Investing in the decision-making process	0.714		
Uniting and sharing ideas between competitors	0.678		
Learning from past crises	0.694		
Media and marketing strategies as a response to the crisis	0.738		
Identifying new market segments	0.641		
Collaboration with the local community	0.723		

### B. Reliability, internal and external validity

As the latent variables used in the model are formative, there is no need to assess Cronbach's alpha, Average Variance Extracted (AVE) and Composite Reliability (CR) (Götz et al., 2009; Hair et al., 2021).

### C. Path analysis

In order to run the model presented in Figure 1, the risk dimensions (AFE results in Table 1) were formatively regressed into a single risk variable. Similarly, the risk mitigation dimensions (AFE results in Table 2) were regressed into a single mitigation variable. Finally, to clarify how important strategic and operational responses are when firms face different types of risk, those two dimensions were assessed separately (AFE results in Table 3). PLS-SEM results indicated that three of the nine risk dimensions are statistically significant: circumstantial risk, economic risk, and organizational risk. Similarly, two of the three dimensions of mitigation are statistically significant: business-related actions and state-support crises. As such, the non-statistically significant dimensions were removed. The outer loading of the significant dimensions is shown in Table 4.

The evaluation of the structural model depicted in Figure 1 adhered to a comprehensive assessment of sign, magnitude, and statistical significance of the parameters, following the methodology outlined by Götz et al. (2009). All constructs were measured at a 5% significance level. Additionally, an analysis of the coefficient of determination ( $R^2$ ) was conducted for the endogenous variables, namely strategic and operational responses. Thus, we conducted the path analysis to verify how risk affects strategic responses (H1), operational responses (H2), and mitigation (H3). Also, how Mitigation affects strategic responses (H4) and operational responses (H5). These effects were evaluated using standardized linear regression coefficients. Subsequently, the potential mediating influence of mitigating factors was examined through the indirect pathways between risk and strategic responses (H6) and between risk and operational responses (H7).

**Table 4: Outer loadings of statistically significant factors of risk and mitigation.**

Note. CILL = Confidence interval lower limit; CIUL = confidence interval upper limit.

Outer relationships	Outer Loading	CILL (0.025)	CIUL (0.975)	p-values
Circumstantial risk → Risk	0.856	0.724	0.940	<b>0.000</b>
Economic risk → Risk	0.795	0.643	0.895	<b>0.000</b>
Organizational risk → Risk	0.795	0.654	0.900	<b>0.000</b>
Business-support → Mitigation	0.875	0.769	0.943	<b>0.000</b>
State-support → Mitigation	0.773	0.645	0.873	<b>0.000</b>

In accordance with the approach outlined by Hair et al. (2021) for assessing mediating effects, the procedure involved initially establishing the significant direct effect between the independent variable (risk) and the dependent variables (strategic and operational responses) while excluding the mediating variable. Subsequently, the significance of the

indirect effect mediated by the mediating variable (mitigation) was examined by including it in the model. Finally, the direct relationship between risk and strategic responses, and risk and operational responses were observed to significantly diminished with the inclusion of the mediator. These steps, conducted sequentially, were executed in this study utilizing Partial Least Squares Structural Equation Modeling (PLS-SEM).

The findings in Table 5 and Figure 1 present the impacts of the variables under consideration. Across all the investigated structural relationships examined, positive parameters are observed, consistent with the propositions discussed in the literature review and providing evidence in support of the research questions. The results demonstrate that risk exerts a positive influence on strategic responses, thus providing support for H1 ( $\beta = 0.212$ ;  $p < 0.001$ ). Similarly, the positive association between risk and operational responses corroborates H2 ( $\beta = 0.181$ ;  $p < 0.001$ ). Consequently, risk reveals a favorable impact on both strategic and operational responses within the examined context. Furthermore, the findings validate H3 ( $\beta = 0.404$ ;  $p < 0.001$ ), establishing that risk positively influences mitigation actions. Mitigating factors, in turn, exhibit significant influences on both strategic responses ( $\beta = 0.263$ ;  $p < 0.001$ ) and operational responses ( $\beta = 0.314$ ;  $p < 0.001$ ), thereby providing empirical support for pathways H4 and H5, respectively. Thus, the results underscore the effect of risk perception on the management practices.

**Table 5: Estimated direct, indirect, and total effects.**

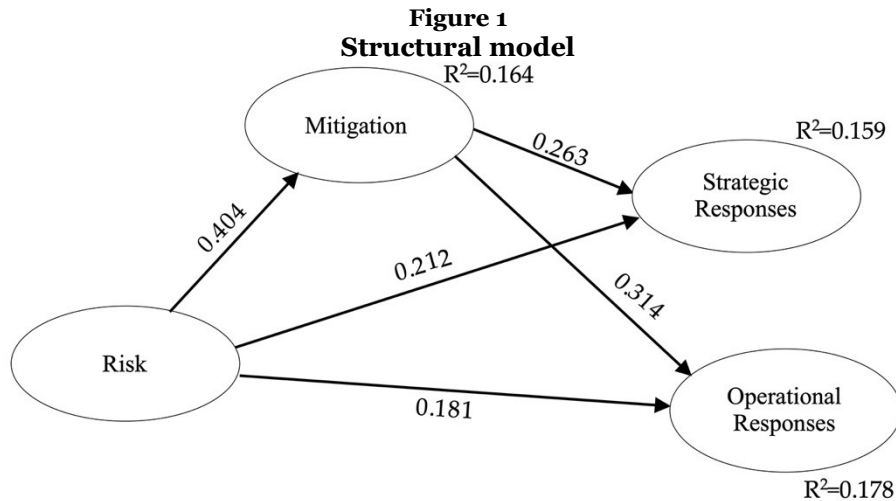
Note. CILL = Confidence interval lower limit with corrected bias; CIUL = confidence interval upper limit with corrected bias;  $f^2$  = Effect size. StratResp = Strategic Responses; OprlResp = Operational Responses.

Path	Direct estimates	CILL (0.025)	CIUL (0.975)	p-values	$f^2$	Pathways	
						Ref.	Validated
<b>Direct effects</b>							
Mitigation → StratResp	0.263	0.136	0.377	0.000	0.069	H <sub>4</sub>	✓
Mitigation → OprlResp	0.314	0.198	0.425	0.000	0.100	H <sub>5</sub>	✓
Risk → StratResp	0.212	0.099	0.327	0.000	0.045	H <sub>1</sub>	✓
Risk → OprlResp	0.181	0.089	0.275	0.000	0.033	H <sub>2</sub>	✓
Risk → Mitigation	0.404	0.305	0.503	0.000	0.196	H <sub>3</sub>	✓
<b>Indirect Effects</b>							
Risk → Mitigation → StratResp	0.106	0.056	0.160	0.000		H <sub>6</sub>	✓
Risk → Mitigation → OprlResp	0.127	0.076	0.187	0.000		H <sub>7</sub>	✓
<b>Total effects</b>							
Risk → StratResp	0.318	0.214	0.418	0.000			
Risk → OprlResp	0.308	0.217	0.399	0.000			

Figure 1 presents the coefficient of determination ( $R^2$ ) for strategic and operational responses as 0.159 and 0.178, respectively. This implies that both risk and mitigating actions collectively explain 15.9% of the variance in strategic responses and 17.8% of the variance in operational responses. Moreover, risk independently accounts for 16.4% of the variability observed in mitigation activities, emphasizing the substantial complementary role of mitigating actions in influencing strategic and operational responses.

Upon scrutinizing effect sizes, as presented in Table 5 and based on Cohen (1988), it

is evident that risk exerts a weak effect on operational responses ( $f^2 = 0.033$ ), strategic responses ( $f^2 = 0.045$ ), and a moderate effect on mitigating actions ( $f^2 = 0.196$ ). Similarly, mitigating actions exhibit a weak effect on both strategic responses ( $f^2 = 0.069$ ) and operational responses ( $f^2 = 0.100$ ). These findings complement the explanatory capacity of mitigating activities in clarifying the observed  $R^2$  for both strategic and operational responses.



Finally, Table 5 highlights the indirect effects clarifying the relationship between risk and strategic and operational responses. The mediating effects of mitigating actions on the association between risk and strategic responses ( $\beta = 0.106$ ) and risk and operational responses ( $\beta = 0.127$ ) are statistically significant ( $p < 0.001$ ), thereby validating the H6 and H7 pathways. Furthermore, based on Zhao et al. (2010), the proportion of indirect effects explained by the direct effects is  $33.33\% - (0.106)/(0.106 + 0.212) = 0.3333$  – for strategic responses and  $41.23\% - (0.127)/(0.127 + 0.181) = 0.4123$  – for operational responses, indicating that mitigation only partially mediates the relationship between risk and planning activities, with operational actions more dominant than strategic responses. These outcomes are consistent with the findings obtained from the assessment of  $R^2$  and  $f^2$ .

#### **D. Multigroup analysis**

A multi-group analysis (MGA) was conducted to assess the relationships among three distinct groups. One comparison involved group1 (leisure and recreation activities firms, with 127 respondents) and group2 (travel agencies and tour operators' firms, with 221 respondents), while the third group (tourism events firms with 68 respondents), was not involved in MGA comparisons as was too small.

Table 6 presents the findings of the comparison between group1 and group2. The analysis indicates significant differences between the two groups in terms of the direct influence of mitigating actions ( $\beta_{\text{diff}} = -0.289$ ;  $p = 0.030$ ) on strategic responses and risk ( $\beta_{\text{diff}} = -0.258$ ;  $p = 0.025$ ) on operational responses, at a 5% significance level. Moreover, the indirect effect of risk on strategic responses through mitigation differs significantly between the two groups ( $\beta_{\text{diff}} = -0.145$ ;  $p = 0.011$ ). These findings suggest that Group2

exhibits larger effects for these relationships compared to Group1. Although the total effect does not reach statistical significance between the two groups ( $\beta_{diff} = -0.223$ ;  $p = 0.052$ ), it is evident that they display distinct behavioral patterns concerning strategic responses.

**Table 6: Multi-group comparison: group1 vs. group2.**

Note. StratResp = Strategic Responses; OprlResp = Operational Responses.

Paths	$\beta$ Group1	$\beta$ Group2	$\beta$ Coefficient differences	p-Values
<b>Direct effects</b>				
Mitigation → StratResp	0.095	0.384	-0.289	<b>0.030</b>
Mitigation → OprlResp	0.395	0.176	0.219	0.116
Risk → StratResp	0.364	0.127	0.237	0.102
Risk → OprlResp	0.056	0.314	-0.258	<b>0.025</b>
Risk → Mitigation	0.290	0.451	-0.161	0.239
<b>Indirect effects</b>				
Risk → Mitigation → StratResp	0.028	0.173	-0.145	<b>0.011</b>
Risk → Mitigation → OprlResp	0.114	0.079	0.035	0.634
<b>Total effects</b>				
Risk → StratResp	0.392	0.300	0.092	0.390
Risk → OprlResp	0.170	0.394	-0.223	0.052

The first group of results is related to the effects of risk perception. The AFE results indicated that tourism firms in the analyzed groups, travel agencies and tour operators, leisure and recreation activities, and tourism events firms, perceive the nine types of risks that Oroian and Gheres (2012) previously validated for tourism agencies, that is, organizational, environmental, competitiveness, economic, political, infrastructure, circumstantial, business insufficiencies, and specific (local) risks. However, the PLS-SEM results showed that only circumstantial, economic, and organizational risks impact the strategic and operational responses. This finding indicates that the strategic and operational responses of the analyzed firms are also derived from factors other than risk perception.

Effectively, the risks that impacted the response to the crisis were related to the economic, internal, and external scope of firms in these tourism subgroups. Organizational risk is internal to the firm including lack of funds, financial support, business theft/fraud by tourists or employees, and inability to meet tourists' needs. Therefore, these are risks that affect the firm's economic results, but which can be managed internally. In turn, economic risks are related to variations in the financial market, such as inflation, interest rates, currency fluctuations that cause a decrease in income, and are external to the firm's control. Likewise, circumstantial risks also encompass situations over which the firm has no control, such as increased competition, internationally and nationally, the reduction in time available for tourism/leisure and stress.

Although tourism is highly dependent on natural resources, the perception of environmental risks does not impact the firm's response, as well as many of the firm's internal risks related to its own business insufficiencies, lack of infrastructure, and

political facts. Sector-specific risks, which include, for example, seasonality, customer complaints and inadequate marketing of the destination, also did not have a significant impact on business response.

On the one hand, the findings reaffirm the assumptions of Hystad and Keller (2008) that tourism SMEs do not have adequate risk management measures in place, and therefore do not implement strategies to respond to a crisis. However, on the other hand, our findings contradict Wang and Ritchie's (2012) suggestion that it is managers' risk perceptions that determine planning strategies and, therefore, business responses to a crisis.

The second group of results is related to mitigation. From one point of view, risk perception positively impacts mitigation and was validated with two factors related to internal and external firm context: business-related actions and state-support crises. The first factor is related to the individual and internal firm context, including marketing, price reductions, billing for non-billable services, and postponement of payment deadlines. However, it also included a sectorial context, collective, based on associating with a network of leisure and recreation or maritime tourism operators. This indicates that these tourism subsectors compensate for their weaknesses as SMEs through associations. Thus, they can create enough pressure to push forward public policies to reduce the negative effects of the crisis and set up some internal actions. This is reflected in the second mitigation factor related to state support actions encompassing, for example, employability scholarships, loans and compensation, tax credits, fee deductions, and funds for marketing campaigns.

In turn, mitigation had a medium effect on the strategic and operational response of firms, and this was greater than the effect of risks on responses. Considering that most of the mitigation mechanisms are governmental, these findings show that governments can have a more significant impact on a firms' response to a crisis than the perception of risks themselves. Therefore, it is confirmed that the government and public policies have a fundamental role in the recovery of the tourism sector and in safeguarding small businesses (Wijaya, 2021). It also reinforces previous findings in the literature regarding the role of DMOs and tourist associations in creating the guidelines that guide firms in terms of risk management (Ritchie & Jiang, 2019).

In contrast, mitigation has a partial mediator effect on the response of the tourism business to risks. There is a positive and statistically significant indirect effect, which is greater on the operational responses than the strategic responses. However, the overall effect of risk-mitigation-response is similar in both cases, strategic and operational. This indicates that mitigation mediates and generates a balance in the impacts on different firm responses. Therefore, mitigation also plays a role in balancing the deficiencies of SMEs in these subsectors related to the lack of a crisis management plan, as through mitigation mechanisms, such as associationism, they are better prepared to develop contingency plans, scenario analysis, risk mapping, etc.

The operational response that involves employee training, sharing ideas, encouraging entrepreneurship, improving decision-making, and learning from past crises, are also internal firm actions, but derived from a network process, a collective process, with

governmental support. Therefore, mitigation becomes an accelerator of the operational response.

The third group of results is related to the heterogeneity of the tourism subsectors and the effects of risk and mitigation on business responses. The direct effects of mitigation on the strategic responses are greater for travel agencies and tour operators (group 2) than for leisure and recreation firms (group 1). On the contrary, risks have different impacts on operational responses, with a greater effect also on travel agencies and tour operators. In turn, the indirect effects were only significant for the Risk → Mitigation → StratResp relationship, but with a low coefficient and a greater effect on group 2. However, the total effects did not confirm significant differences between the groups. This result indicates that public policies and associationism generate homogenization in the diversity of the business context of the tourism sector, and therefore, are serving one of its purposes.

## **V. Conclusions**

This study had a twofold objective. First, categorizing the risks of tourism subsectors. Second, assessing the effect of risks on strategic and operational responses in the tourism subsectors mediated by a mitigation dimension. We performed an Exploratory Factor Analysis (AFE), a Partial least squares structural equations modelling (PLS-SEM), and a Multigroup Analysis (MGA) via SmartPLS.

Our findings on organizational and competitive risks contribute to this narrative, highlighting the internal and market-related challenges unique to tourism subsectors. We provided a model that recognizes the diverse and changing nature of risks, enabling more responsive and tailored risk management strategies.

Our results corroborate RQ1 as the AFE outputs confirmed that the Oroian and Gheres (2012) risk framework applies to the different tourism industry subsectors, such as travel agencies and tour operators, leisure and recreation activities, and tourism events firms.

Our analysis confirmed Oroian and Gheres (2012) risk framework using an AFE with three tourism subsectors: travel agencies and tour operators, leisure and recreation activities, and tourism events firms. However, our findings go beyond this scope and produce a theoretical contribution as we tested the effect of these nine risk categories on the business responses and the mitigation effects as mediators. Our model tested the pathways to affirm RQ2 and RQ3. We confirmed that risks affect strategic and operational responses, but only three of the nine factors of Oroian and Gheres's (2012) risk framework are significant. However, the set of analyses, PLS-SEM and MGA, showed that risks did not affect the strategic responses of tourism subsectors differently. Thus, the answer to RQ2 is no. On the contrary, the answer to RQ3 is yes because risk affects the operational response of tourism subsectors differently.

Risk leads to similar mitigation among both groups. The influence of mitigation actions on strategic actions has a greater impact on group 2 when compared with group 1. Concerning direct effects, the risk is more significant for operational actions in group 2 (travel agencies and tour operators).

These firms seem able to implement operational actions more swiftly in response to risk, and the mitigation actions lead them to also to adjust their strategic responses. These findings offer a theoretical model and practical implications that help managers rethink some responses to risk perception. Results suggested that some specific tourism risks are understood as usual conditions and not risks, for instance, seasonality or environmental risks. Our results can be viewed from two perspectives. Firstly, the validated variables introduce a novel explanatory model of risks and business responses to tourism subsectors in the literature. Secondly, the non-validated variables and risk factors showed the deficiencies of managers' risk perception to create the necessary strategic and operational responses.

In addition to PLS-SEM building a model that supports RQ4 we identify two major issues. Mitigation actions have a fundamental role in generating strategic and operational responses in these tourism subsectors and have a higher effect than the risk perception impact on the business responses. Also, mitigation action minimizes the heterogeneity of the tourism sector's response to a crisis. These findings have implications for public policies in addition to managerial and theoretical ones.

Our study had limitations mainly related to the sample size and number of subsectors. We suggest further research with more subsectors to generalize the results and create an explanatory model for the entire tourism industry. Furthermore, qualitative research is necessary to understand why managers recognize the nine risk factors but only responds to three. A comparison between SMEs and large firms in the tourism industry could also generate some helpful insights to create public policies and mitigation actions and understand the best practices for strategic and operational responses.

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## REFERENCES

- Abdelsalam, O., Aysan, A. F., Cepni, O., & Disli, M. (2023). The spillover effects of the COVID-19 pandemic: Which subsectors of tourism have been affected more? *Tourism Economics*, 29(2), 559-567. <https://doi.org/10.1177/13548166211053670>
- Aliperti, G., Sandholz, S., Hagenlocher, M., Rizzi, F., Frey, M., & Garschagen, M. (2019). Tourism, crisis, disaster: An interdisciplinary approach. *Annals of Tourism Research*, 79, 102808. <https://doi.org/10.1016/j.annals.2019.102808>
- Backer, E., & Ritchie, B. W. (2017). VFR travel: A viable market for tourism crisis and disaster recovery? *International Journal of Tourism Research*, 19(4), 400-411. <https://doi.org/10.1002/jtr.2102>
- Bera, A., Drela, K., Malkowska, A., & Tokarz-Kocik, A. (2020). Mitigating risk of the tourism sector in the European Union member states during the COVID-19 pandemic. *European Research Studies Journal*, XXIII(4), 107-122.
- Blake, A., & Sinclair, M. T. (2003). Tourism crisis management: US response to September 11. *Annals of Tourism Research*, 30(4), 813-832. [https://doi.org/10.1016/S0160-7383\(03\)00056-2](https://doi.org/10.1016/S0160-7383(03)00056-2)
- Cushnahan, G. (2012). Crisis management in small-scale tourism. In *Safety and Security in Tourism* (pp. 325-340). Routledge.
- Demiralay, S., & Kilincarslan, E. (2019). The impact of geopolitical risks on travel and leisure stocks. *Tourism Management*, 75, 460-476. <https://doi.org/10.1016/j.tourman.2019.06.013>
- Franzoni, S., & Pelizzari, C. (2016). Weather risk management in tourism industry. *Symphonya. Emerging Issues in Management*(1), 45-55. <https://doi.org/10.4468/2016.1.05franzoni.pelizzari>
- González Rodríguez, J. C., & Acevedo-Navas, C. (2021). Diagnóstico de riesgos en el sector turístico latinoamericano para el trienio 2020-2022. *Revista Científica General José María Córdova*, 19(34), 332-355.
- Gössling, S., Scott, D., & Hall, C. M. (2020). Pandemics, tourism and global change: a rapid assessment of COVID-19. *Journal of Sustainable Tourism*, 29(1), 1-20. <https://doi.org/10.1080/09669582.2020.1758708>
- Götz, O., Liehr-Gobbers, K., & Krafft, M. (2009). Evaluation of structural equation models using the partial least squares (PLS) approach. In V. Vinzi, W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares: Concepts, methods and applications* (pp. 691-711). Springer, Berlin, Heidelberg. [https://doi.org/10.1007/978-3-540-32827-8\\_30](https://doi.org/10.1007/978-3-540-32827-8_30)
- Hair, J., Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage Publications.
- Hamm, D., & Su, C.-H. J. (2021). Managing tourism safety and risk: Using the Delphi expert consensus method in developing the event tourism security self-beliefs scale. *Journal of Hospitality and Tourism Management*, 49, 364-374. <https://doi.org/10.1016/j.jhtm.2021.10.001>
- Hystad, P. W., & Keller, P. C. (2008). Towards a destination tourism disaster management framework: Long-term lessons from a forest fire disaster. *Tourism Management*, 29(1), 151-162. <https://doi.org/10.1016/j.tourman.2007.02.017>
- Kozak, M., Crotts, J. C., & Law, R. (2007). The impact of the perception of risk on international travellers. *International Journal of Tourism Research*, 9(4), 233-242. <https://doi.org/10.1002/jtr.607>
- Lee, C. C., Olasehinde-Williams, G., & Akadiri, S. S. (2021). Geopolitical risk and tourism: Evidence from dynamic heterogeneous panel models. *International Journal of Tourism Research*, 23(1), 26-38. <https://doi.org/10.1002/jtr.2389>
- Lee, K.-H., & Hyun, S. S. (2015). A model of behavioral intentions to follow online travel advice based on social and emotional loneliness scales in the context of online travel communities: The moderating role of emotional expressivity. *Tourism Management*, 48, 426-438. <https://doi.org/10.1016/j.tourman.2014.12.012>
- Lu, S., & Law, R. (2006). Technology crisis management in Mainland China: a study of hotels in Hangzhou. *Information Technology in Hospitality*, 4(4), 153-159. <https://doi.org/10.3727/154595306779868449>

- Mawby, R. (2014). Crime and disorder, security and the tourism industry. In M. Gill (Ed.), *The Handbook of Security* (pp. 383-403). Palgrave Macmillan. [https://doi.org/10.1007/978-1-349-67284-4\\_18](https://doi.org/10.1007/978-1-349-67284-4_18)
- Mingqi, W. (2015). Analysis on Risk Management of the Small and Medium-sized Travel Agencies. 2015 Joint International Social Science, Education, Language, Management and Business Conference, Chongqing, China.
- Mohanty, S., Nandha, M., Habis, E., & Juhabi, E. (2014). Oil price risk exposure: The case of the US travel and leisure industry. *Energy Economics*, 41, 117-124. <https://doi.org/10.1016/j.eneco.2013.09.028>
- Nasr, N. E. S. (2017). Risk management in the light of travel agencies activity in Egypt. *International Journal of Heritage, Tourism, and Hospitality*, 10(2), 2.
- Okumus, F., Altinay, M., & Arasli, H. (2005). The impact of Turkey's economic crisis of February 2001 on the tourism industry in Northern Cyprus. *Tourism Management*, 26(1), 95-104. <https://doi.org/10.1016/j.tourman.2003.08.013>
- Orchiston, C. (2013). Tourism business preparedness, resilience and disaster planning in a region of high seismic risk: The case of the Southern Alps, New Zealand. *Current Issues in Tourism*, 16(5), 477-494. <https://doi.org/10.1080/13683500.2012.741115>
- Oroian, M., & Gheres, M. (2012). Developing a risk management model in travel agencies activity: An empirical analysis. *Tourism Management*, 33(6), 1598-1603. <https://doi.org/10.1016/j.tourman.2011.12.020>
- Paraskevas, A., & Arendell, B. (2007). A strategic framework for terrorism prevention and mitigation in tourism destinations. *Tourism Management*, 28(6), 1560-1573. <https://doi.org/10.1016/j.tourman.2007.02.012>
- Perl, Y., & Israeli, A. A. (2011). Crisis management in the travel agency sector: A case study. *Journal of Vacation Marketing*, 17(2), 115-125. <https://doi.org/10.1177/1356766710392478>
- Pestana, M. H., & Gageiro, J. N. (2014). *Análise de dados para ciências sociais: a complementaridade do SPSS* (6 ed.). Edições Sílabo.
- Pfarr, C. (2009). Crisis management in tourism: A review of the emergent literature. In P. Hosie & C. Pfarr (Eds.), *Crisis management in the tourism industry: Beating the odds* (pp. 37-52). Ashgate Publishing.
- Ritchie, B. W. (2004). Chaos, crises and disasters: a strategic approach to crisis management in the tourism industry. *Tourism Management*, 25(6), 669-683. <https://doi.org/10.1016/j.tourman.2003.09.004>
- Ritchie, B. W., & Jiang, Y. (2019). A review of research on tourism risk, crisis and disaster management: Launching the annals of tourism research curated collection on tourism risk, crisis and disaster management. *Annals of Tourism Research*, 79, 102812. <https://doi.org/10.1016/j.annals.2019.102812>
- Ritchie, J. B., & Crouch, G. I. (2003). *The competitive destination: A sustainable tourism perspective*. Cabi.
- Wang, J., & Ritchie, B. W. (2010). A theoretical model for strategic crisis planning: Factors influencing crisis planning in the hotel industry. *International Journal of Tourism Policy*, 3(4), 297-317. <https://doi.org/10.1504/IJTP.2010.04039>
- Wang, J., & Ritchie, B. W. (2012). Understanding accommodation managers' crisis planning intention: An application of the theory of planned behaviour. *Tourism Management*, 33(5), 1057-1067. <https://doi.org/10.1016/j.tourman.2011.12.006>
- Wijaya, O. Y. A. (2021). Risk Management Mitigation in the New Normal Era. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)*, 4(1), 1088-1097. <https://doi.org/10.33258/BIRCI.V4I1.1716>
- Yang, E. C. L., & Nair, V. (2014). Tourism at risk: A review of risk and perceived risk in tourism. *Asia-Pacific Journal of Innovation in Hospitality and Tourism (APJIHT)*, 3, 1-21. <https://doi.org/10.7603/s40930-014-0013-z>
- Zenker, S., & Kock, F. (2020). The coronavirus pandemic - A critical discussion of a tourism research agenda. *Tourism Management*, 81, 104164. <https://doi.org/10.1016/j.tourman.2020.104164>

Zibanai, Z. (2014). Is the tourism industry a fragile heavy weight? Validation through a literature review of tourism system shocks. *Journal of Tourism Management Research*, 1(1), 1-13. <https://doi.org/10.18488/journal.31/2014.1.1/31.1.1.13>