



AMERICAN JOURNAL OF TOURISM AND HOSPITALITY (AJTH)

ISSN: 2993-6519 (ONLINE)

VOLUME 2 ISSUE 1 (2024)

PUBLISHED BY

E-PALLI PUBLISHERS, DELAWARE, USA

Dimensions of Business Resilience in the Floral Industry: A Factor Analysis

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Article Information

Received: July 01, 2024

Accepted: August 06, 2024

Published: August 10, 2024

Keywords

*Tourism, Hotel and Management,
Business Resilience, Floral
Industry, Exploratory Factor
Analysis, Macau*

ABSTRACT

This study aims to establish a framework for understanding the dimensions of business resilience in the context of post-disaster recovery among floral establishments in Macau. A descriptive method was employed to characterize or describe the factors or attributes contributing to the resilience of these businesses. In addition, multivariate analysis using exploratory factor analysis was conducted to uncover and determine the underlying factor structure. This analysis facilitated the identification of various dimensions of business resilience. Through personal and electronic surveys, the survey questionnaire was administered to 300 respondents, consisting of managers and employees of businesses affected by the COVID-19 pandemic. A thematic approach was employed to derive meaningful data from the themes. The number of iterations conducted before arriving at the final factor was 25. The exploratory factor analysis identified six valid dimensions of business resilience in the floral industry in Macau. These six factors are labeled as (a) readiness and control, (b) philosophy and values, (c) emergency preparedness for planning, (d) communications, (e) good governance, and (f) linkages support.

INTRODUCTION

During the COVID-19 pandemic, floral businesses in Macau encountered many a myriad of challenges that necessitated further investigation through a study. These challenges included disruptions in the supply chain leading to shortages and increased prices, decreased demand due to canceled events and gatherings, closure of retail spaces impacting sales, a shift in consumer behavior favoring essential purchases over discretionary spending, financial strain exacerbated by reduced revenue, and difficulties in adapting to online sales channels. Understanding the full extent of these issues and their implications is crucial for devising effective strategies to support the recovery and resilience of the floral industry in Macau, making a study imperative for informed decision-making and policy formulation.

Organizations are expected to operate under typical conditions daily, following standard processes and activities. Businesses, non-profits, and government agencies are significant community stakeholders because they provide goods and services, employment opportunities, revenue flow, and community support. Consequently, these groups play a vital role in preserving public health and well-being, making it critical to ensure that these organizations continue to function in the event of a crisis (Campos, 2015).

Additionally, crises or disasters highlight the necessity for business communities to engage in emergency preparedness initiatives to enhance their resilience. Most Micro, Small, and Medium Enterprises (MSMEs) in developing countries are characterized by informality and noncompliance with industry norms and regulations, which limits their capacity to adopt risk management tools and expand their customer and supply bases

(Campos, 2015). This situation is further exacerbated by governments' focus on relief, search and rescue operations, and social services (Ballesteros & Domingo, 2015). The impacts of natural disasters can be devastating to business operations and viability. MSMEs are particularly vulnerable due to their relative resource constraints and lower resilience. Recent studies indicate that while MSMEs in the Philippines are relatively flexible, they have limited access to a broader set of coping strategies and are generally unprepared for nature-related disasters.

As espoused by Adekola and Clelland (2020) argue that businesses that have the capacity to recover quickly can continue to provide employment and services in affected areas. Likewise, members of a community that is prepared for emergencies tend to recover faster and, thus, are more likely to be able to support businesses and economic recovery (either as employees or customers) (Paton & Johnston, 2017). Thus, there is the suggestion that the resilience of businesses and those of local communities are closely linked. Organizational resilience is a continuously moving target, which contributes to performance during business-as-usual and crisis situations (Mitroff, 2005; Campos, 2015). It requires organizations to adapt and be highly reliable (Vogus & Sutcliffe, 2007), and it to be highly reliable (Vogus & Sutcliffe, 2007), and enables them to manage disruptive challenges (Durodie, 2003).

To address this research gap, the proposed study aims to conduct an exploratory factor analysis on the resilience of the floral industry, examining various scales or dimensions that contribute to resilience. Despite the increasing global importance of post-pandemic recovery, there has been virtually no research characterizing business resilience in this context. Although numerous policies and studies

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evaluate disaster or crisis preparedness, none specifically focus on business resilience during post-pandemic recovery. This study seeks to fill this gap in knowledge and provide valuable insights for both governments and floral businesses in navigating post-pandemic challenges and enhancing resilience.

This study aims to develop a framework on factors affecting business resilience in the floral industry in Macao China. Furthermore, this study was guided by the following objectives: to identify the factor structures of business resilience in the floral industry and to develop a multidimensional framework for business resilience within this industry.

This study operates under the assumption that business resilience in the floral industry of Macau's recovery is multidimensional and is influenced by various factors, namely Factor 1, Factor 2, Factor 3, and so on up to Factor n.

This section presents a review of the relevant literature, including books, journals, articles, and internet sources from various authors, which are pertinent to the current research on business resilience recovery. It focuses on the factors that characterize business resilience in the floral industry of Macau, specifically regarding readiness and control, philosophy and values, emergency preparedness for planning, communications, good governance, and linkages support.

Dimension of Business Resilience

Our world is more technologically advanced and interconnected, with risks increasingly crossing local, regional, and national boundaries. We are also more culturally diverse than ever before. Consequently, communities are frequently confronted with emergencies and crises that challenge their social and economic stability. Campos (2009) describes resilience as a reaction to an event, arguing that it is demonstrated after a crisis has occurred. To measure resilience during normal operations, he focused on measuring latent resilience or resilience potential. However, this approach overlooks the positive role resilience can play in helping organizations avoid crises, such as monitoring and detecting through the monitoring and detection of early warning signals that can prevent crises or decline. Weick and Sutcliffe (2011) discuss high reliability as a key characteristic of resilience and propose a series of nine audits to measure it. Each resilience audit consists of questions based on high reliability and organizational theory. Similarly, Campos (2015) advocates for the use of Weick and Sutcliffe's resilience audits by organizational managers to create mindfulness and diagnose areas needing specific attention. However, these audits have yet to be fully quantitatively tested. Lastly, Fiksel (2003) discusses the resilience approach, noting that resilient organizations understand it is impossible to prevent all crises and disasters all the time. Instead, they monitor their organization as a system with inputs and outputs, the characteristics of which can provide information about the system's health.

An increasing body of knowledge has reported on various components of frameworks related to disaster preparedness, risk reduction, and recovery, both in the context of communities and the businesses within them. As disasters are integral considerations for businesses, being a significant macro-environmental force, these frameworks should have realistic components and outline the specific context of the businesses being studied. This study draws on literature related to the post-disaster recovery of businesses in Davao City to support the framework derived, which will be presented in the later analysis of this paper. The factors include readiness and control, philosophy and values, emergency preparedness for planning, communications, good governance, and linkages support.

Readiness and Control

An inadequate response may stem from either a complete absence of capability or a lack of experience in formulating a suitable reaction, as pointed out by Miyan (2014). In either scenario, policymakers face heightened challenges, which in turn exacerbate the strain on response capabilities. Nevertheless, the magnitude of the crisis can be lessened and effectively managed if institutions remain adaptable to changing circumstances, as suggested by Campos (2015). They ought to possess the capacity to glean insights from their operational surroundings, assimilate ongoing experience, and adjust their strategies accordingly.

Cavallo, Galiani, Noy, and Pantano (2013) asserted that the institutional framework plays a crucial role in shaping these dynamics. Stronger pre-earthquake institutions are likely to exhibit greater resilience in facing the shock and navigating the subsequent recovery phase. Conversely, in contexts where institutions are weaker, there's a higher probability of misallocation and diversion of substantial financial aid towards less productive endeavors. This misallocation negatively impacts the technical efficiency of the economy and contributes to a further decline in institutional quality. Ultimately, the earthquake may amplify regional disparities in both economic and social development over the long term.

Emergency Planning and Preparedness

Cowan and Simpson (2011) emphasized the importance of ensuring that businesses are adequately prepared for imminent disasters, with a primary focus on the robustness of their preparations. One critical aspect is raising awareness within the business community, particularly in regions prone to hazards, to foster a deep understanding of the significance of disaster risk reduction for sustainable development and poverty alleviation. To achieve this, there must be a concerted effort to establish a comprehensive foundation of evidence. This entails the development of extensive data on hazard mapping, physical exposure, disaster losses, and the socio-economic impact of disasters at both national and community levels. Furthermore, this evidence is

essential for substantiating the necessity of proactive disaster risk management and for crafting development policies and initiatives that are sensitive to risk factors.

Philosophy and Values

The United Nations International Strategy for Disaster Reduction (2009) highlighted the necessity for organizations and institutions to integrate disaster risk reduction into their corporate objectives to safeguard their business interests against disasters. This commitment should be clearly outlined in their company handbooks. Moreover, prioritizing disaster preparedness and recovery should be ingrained in public policies addressing disaster risks across various domains, including publicly owned, managed, or regulated services and infrastructures, as well as the environment. These policies should also encompass regulations and incentives for actions by households, communities, businesses, and individuals. Effective public policies on risk management require robust governance frameworks that involve national and local governments, civil society, the private sector, and the scientific and academic sectors. Similarly, mechanisms for generating information and knowledge on risk and risk management alternatives should be accessible to policymakers at all levels, from individuals and households to international organizations.

Linkages Support

According to Benson and Clay (2003), the swift recovery of business operations post-disaster hinges on the coordination and implementation capabilities of business management working in tandem with disaster management agencies. As the focus shifts towards a more proactive stance, the nature of this coordination should evolve from top-down oversight to a more participatory model. Enhanced organizational, managerial, and task coordination is essential at both national and international levels. Given that risk reduction entails bolstering the resilience of the most vulnerable communities to withstand hazard impacts, the approach must prioritize a bottom-up strategy with the active involvement of all stakeholders.

Communication

In times of disaster, it's imperative to swiftly distribute information to both the affected populace and those involved in disaster response efforts (Paton, Kelly & Doherty, 2006). Effective communication during such crises often relies on established crisis communication methods. However, to grasp the connection between a crisis and a disaster, it's essential to comprehend their relationship (Campos, 2015). Unlike crises, disasters are entirely external events triggered by natural occurrences, for which no organization bears responsibility (Foster, 2012).

The research was based on Chang's (2010) investigation, which underscores resilience as an evolving process intertwined with the recovery of individuals, businesses, communities, and institutions. Contrary to the common approach of categorizing post-disaster business resilience as a binary concept—where businesses are seen as either open or closed at a particular moment in time—many studies adopt this viewpoint (Marshall & Schrank, 2014). Another foundation lies in the typology established by the Disaster Research Center (DRC), one of the earliest typologies crafted to examine organizational reactions to crises. This study then proceeds to present and assess five approaches concerning organizations' responses to crises. These approaches encompass adaptive fit, the edge of chaos, power laws, crisis turnarounds, and high reliability organizations. In the face of disruption and uncertainty, organizations demonstrate varied levels of resilience or conversely, failure, by: (a) centralizing internal controls (LaPorte, 1996); (b) adapting (Ashkanasy *et al.*, 2002); (c) learning (Weick *et al.*, 2005); and (d) being creative (Kendra & Wachtendorf, 2003).

Figure 1 depicts the conceptual framework of the study, outlining the various observed factors that define the latent variable under investigation: the business resilience of the floral industry in Macau during a recovery phase. The illustration suggests the presence of underlying factors or components within this latent variable, denoted as Factor 1, Factor 2, Factor 3, and so forth. These factors remain provisional, as further analysis in the study will identify and label them based on thematic commonalities.

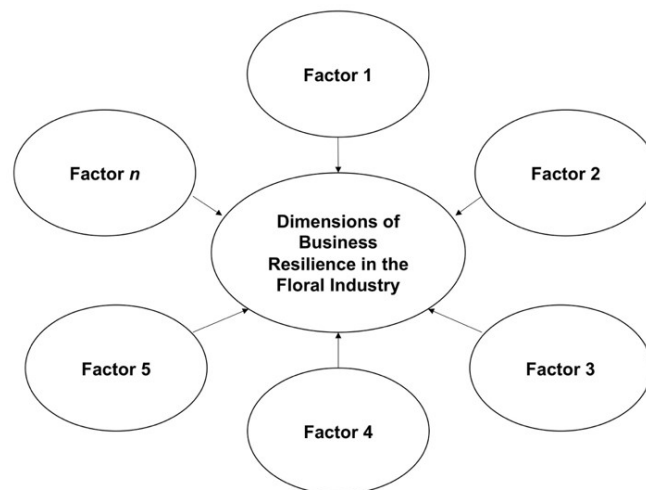


Figure 1: The Conceptual Framework of the Study

METHODOLOGY

Population and Sample

The study surveyed 300 business owners and managers from the floral industry in Macau. As noted by Olivar (2021), citing Siddiqui (2013), a minimum of 300 respondents is necessary to derive meaningful insights. Additionally, the respondents employed a stratified random sampling procedure to establish a sampling frame. This approach allows for the estimation of population parameters using weighted sample data obtained through simple random sampling from each stratum, as emphasized by Aoyama (1954). The total sample comprises 300 respondents, including business owners, managers, and employees.

Regardless of ethnicity, the respondents consisted of legal adults who were business owners and managers in the floral industry of Macau. The research survey was conducted within the specified geographic location, with respondents selected randomly based on their expressed interest in understanding the purpose of the analysis. This approach ensures that the study encompasses diverse responses, thereby facilitating the achievement of its objectives. The researcher was responsible for recruiting the respondents, excluding individuals who were not of legal age or employees.

Research Design

This study delved into the dimensions of business resilience concerning post-disaster or crisis recovery. To tackle this issue, a combination of quantitative and qualitative methodologies was employed. Quantitative

research, as described by Campos (2015), is characterized by deductive reasoning, objectivity, and the use of structured instruments along with statistical data analysis techniques. In this study, a descriptive method was utilized to delineate the factors or attributes of business resilience among businesses in Macau. Additionally, multivariate analysis, conducted through exploratory factor analysis, was employed to unearth and establish the underlying factor structure using various analytical techniques. Primary data for this research were derived from both key informant interviews and respondents of the study. The key informant interviews were conducted separately to gather responses, which subsequently formed a list of potential factors or variables influencing business resilience. Based on the collected response items, a survey questionnaire was developed and administered to business establishments, with participation sought from owners, managers, and employees alike.

Materials and Instrument

During the development of the survey instrument, the researcher conducted an interview to triangulate and finalize the list of factors pertaining to business resilience. Additionally, the researcher adapted the framework outlined by Campos (2015) for the dimensions of business resilience in the floral industry, modifying it to align with the study's context. This adapted framework was then presented to a panel of experts for validation. When assessing the dimension of business resilience in the floral industry, the scale employed to interpret the respondents' responses is outlined below:

Range of Mean	Description	Interpretation
4.20-5.00	Highly essential	The factor was deemed very important to achieve business resilience.
3.40-4.19	Essential	The factor was deemed important to achieve business resilience.
2.60-3.39	Somehow essential	The factor was deemed somehow important to achieve business resilience.
1.80-2.59	Less essential	The factor was deemed less important to achieve business resilience.
1.00-1.79	Not essential	The factor was deemed not important to achieve business resilience.

The questionnaires were subjected to validation of experts for refinement. After the questionnaires were validated for corrections, comments and suggestions, the questionnaires were used in gathering the data.

Despite the pandemic and restrictions on gathering data, the researcher utilized a combination of face-to-face interaction and Google Forms survey as the mode of data collection to reach the respondents.

Statistical Tools

The subsequent statistical methods were employed in computing data and testing hypotheses at a significance level of 0.05:

Descriptive Statistics

Utilized to illustrate the institutional and operational profiles of the businesses.

Mean

Employed to depict the extent of agreement with statements that delineate business resilience during the recovery phase.

Exploratory Factor Analysis

Utilized to discern the prominent factor structures representing the dimensions of business resilience.

Kaiser-Meyer-Olkin (KMO)

Utilized to assess the appropriateness of the data for factor analysis.

Ethical Considerations

The researcher adhered to comprehensive ethical standards, holding UMERC certification under the issuance number UMERC-2023-048, throughout the

study's execution. This adherence encompassed diligent adherence to study protocol evaluations and standardized criteria. Key aspects included managing the population and data, incorporating principles such as voluntary participation, privacy, confidentiality, informed consent procedures, recruitment practices, consideration of risks and benefits, avoidance of plagiarism, fabrication, falsification, conflicts of interest, deceit, obtaining permissions from relevant organizations, and ensuring proper authorship attribution.

RESULTS AND DISCUSSION

Factors of Business Resilience Dimension in the Floral Industry

This study examined and searched for new factors that could affect business resilience in the floral industry in Macau, search for new factors that could effects of business resilience in the floral industry at Macau China. Using Exploratory factor analysis (EFA) to know and search for new factors that could significantly contribute to the preparedness of the business's resilience when a pandemic

or another emergency happens new factors that could be significantly contribute to the preparedness of the business's resilience when pandemic or another emergency hap forced majeure. There are six factors found using the EFA, out using the EFA namely (Readiness and control, philosophy and values, emergency preparedness for planning, communications, good governance, and linkage support).

The factors of the business resilience dimension in the floral industry are business resilience dimension in the floral industry displayed in Table 1. To distinguish between the possibility of factors of the dimension of business resilience in the floral industry, Kaiser–Meyer–Olkin (KMO) and Bartlett's Tests of Sphericity were utilized in the analysis. Upon evaluation of the data, we determined the KMO measure to be satisfactory, with a sampling adequacy value of 0.825, indicating its suitability for the dataset. Additionally, Bartlett's Test of Sphericity yielded a statistic of 2710.74, with a significant coefficient of 0.001. These results allowed for the conduct of factor analysis on the data. A significance level below 0.05 indicates the viability of factor analysis.

Table 1: Rotated component matrix showing the dimensions of business resilience in the floral industry

Item	Component					
	1	2	3	4	5	6
38. 當通常的資源不可用時,它可以即時改進而發揮用處。 it can improvise when usual resources are not available.	0.635					
40. 投資於培訓其他人員應對危險的情況。 it invests in training its personnel for risky situations.	0.548					
15. 可以表現出對其未來活動的信心。 it can exhibit confidence in its future activities.	0.46					
35. 鼓勵所有人員為未來的索償購買保險。 it encourages all personnel to get insurance for future claims.	0.449					
45. 確保隨時觀察帶準備就緒。 it ensures that readiness is observed at all times.	0.438					
5. 可以利用技術檢測和評估災害的破壞程度。 it can utilize technology in monitoring and assessing the extent of the damage of the disaster.		0.609				
1. 可以在災難時或需要時尋求專家援助。 it can source expert assistance during a disaster or in times of need.		0.533				
19. 將對企業造成的損害程度進行災前評估。 it conducts its pre-disaster assessments on the extent of damages that will hit the business.		0.446				
34. 僱用了災難和風險緩解官員。 it hires a disaster and risk mitigation officer.		0.446				
4. 可以吸收一種富有和同情心的企業理念,即先照顧他人再自利。 it can be imbued with a compassionate corporate philosophy of taking care of others before self-interest.		0.404				
12. 可以補償自願者對重建業務的努力。 it can compensate the efforts of volunteers to rebuild the business.			0.674			
18. 有工作場所健康和 safety 計劃。 it has workplace health and safety plan.			0.598			

8. 可以參與有關氣候變化或任何環境問題的會談或討論。 it can participate in talks or discussions about climate change or any environmental issue.			0.587			
22. 可以儲備一些用品和材料,以備不時之需。 it can keep a stock of supplies and materials that can be used in times of emergencies.			0.433			
41. 進行地震、火災和颱風的備災和訓練。 it conducts disaster preparedness and drills for earthquakes, fires and typhoons.				0.471		
48. 可以為減少和管理風險提供資源手冊。 it can provides a resource manual for risk reduction and management.				0.541		
37. 有導師或顧問與業主進行討論業務準備。 has a mentor or consultant who discusses business preparedness with the owners.				0.489		
32. 有一個加強業務的長期計劃。 it has a long-term plan to strengthen the business.				0.408		
26. 有完善的財務管理計劃。 it has a sound financial management plan.					0.579	
31. 有解決治理和合規問題的計劃。 it has a plan to address governance and compliance issues.					0.408	
24. 可以要求員工配合重建業務。 it can request employees to cooperate with rebuilding the business .					0.401	
6. 可以保持商務“一切照舊”的概念 it can maintain the philosophy of “business as usual”						0.571
2. 可以與當地規劃人員、應急管理人員和公共工程官員協調,為財產損失或損失做好準備。 it can coordinate with local planners, emergency managers, and public works officials to prepare for instances of damage or loss of properties.						0.488
7. 可以與其他企業會面,共同努力重建他們剩下的機構。 it can meet with other businesses in working together to rebuild what was left of their establishments.						0.401
Eigenvalue	13.477	1.77	1.399	1.356	1.283	1.149
% Variance Explained	0.27	0.035	0.028	0.027	0.026	0.023
KMO measure of sampling adequacy = 0.825						
Bartlett's test of sphericity $\chi^2 = 2710.74, p < 0.05$						

Note: Items in red are cross-loadings or did not meet the +0.50-coefficient threshold

The VARIMAX technique, utilizing maximum likelihood estimation, was utilized. Criteria outlined by Mutia and Montaña (2023) were employed to gauge the practical significance of standardized factor loadings. For a sample size of 300 respondents or more, factor loadings of +0.5 or greater were deemed significant for consideration. A total of 25 iterations were conducted to derive the final factor loadings. Consequently, values and items exhibiting cross-loadings were excluded from the analysis.

The foundation for labeling the factors within the established dimension of business resilience in the floral industry was the identification of heavily loaded indicators. Eigenvalues and the percentage of variance were key considerations in the data analysis, illustrating

and elucidating the suitability of the items as indicators of the factor. As per the analysis, the data pertaining to the six factors elucidate 40.90% of the cumulative variance in the dimensions of business resilience within the floral industry. Conversely, the remaining 59.10% is accounted for by other significant items not encompassed in the scale.

The first factor obtained an eigenvalue of 13.477, explaining 27 % of the variance in the dimension of business resilience in the floral industry, including items: it can improvise when usual resources are not available, it invests in training its personnel for risky situations, it can exhibit confidence in its future activities, it encourages all personnel to get insurance for future claims, and it ensures

that readiness is observed at all times. These items are loaded into the first factor, named “Readiness and control.” These findings corroborate the research conducted by Su, McDonnell, and Ahmad (2022), which advocates for a proactive, preemptive, and people-centric approach to readiness and control in business resilience. Such an approach is deemed vital for not only surviving but also thriving in the aftermath of disasters, while effectively managing fear and uncertainty. Therefore, establishing a readiness and control strategy for business resilience becomes imperative for organizations to adeptly mitigate, prepare for, respond to, and recover from potential disaster impacts, as emphasized by Anderson and Libell (2020). This strategy enables key stakeholders to comprehensively consider most, if not all, factors influencing the transition of disasters from current news headlines to historical lessons. Adopting a disaster-ready mindset and implementing preemptive measures and diverse mitigation strategies facilitate the prediction, management, and control of disasters.

In floral industry, the findings underscore the importance of a readiness and control strategy for business resilience to ensure continuity and recovery during and after disasters. Practically, this means implementing proactive measures such as diversifying supply chains, training staff in emergency protocols, and investing in technology for remote operations. Theoretically, it suggests that a people-centered approach to resilience, as highlighted by Su, McDonnell, and Ahmad (2022), can help florists not only survive disruptions but also thrive by managing fear and uncertainty effectively. By adopting such strategies, floral businesses can mitigate adverse impacts, ensure smooth operations, and maintain their presence in the market, even as disasters move from immediate crises to historical events.

The second factor yielded an eigenvalue of 1.77, accounting for 30.5% of the variance in the dimension of business resilience within the floral industry. This factor encompasses various components. It involves leveraging technology for monitoring and assessing disaster damage, seeking expert assistance during crises or periods of need, conducting pre-disaster assessments to anticipate potential business impacts, employing a dedicated disaster and risk mitigation officer, and embracing a corporate philosophy prioritizing compassion over self-interest. These components are grouped under the second factor, termed “Philosophy and values.”

These findings align with the study by Sahir, Saputra, and Sari (2021), which emphasizes that the philosophy and values of business resilience require collaborative efforts to foster mutual understanding and complementary skills. In contemporary times, the community strengthens its bonds by adhering to ethical principles and cross-cultural understandings, aiming to bolster business resilience on both local and global scales (Wolf, Haddock, Manstead, & Maio, 2020). Consequently, the capacity for collaboration is indispensable for SMEs, given that each business harbors distinctive competitive strengths.

In the floral industry, the emphasis on collaboration for

business resilience suggests that florists should actively engage in partnerships and networks to share knowledge and skills, enhancing their ability to withstand disruptions. Practically, this means participating in industry associations, forming alliances with other local businesses, and fostering cross-cultural connections to access diverse resources and markets. Theoretically, it highlights the importance of a collaborative philosophy and shared values in building resilience, as noted by Sahir, Saputra, and Sari (2021). By integrating these collaborative efforts, floral businesses can leverage their unique strengths and collectively address challenges, ensuring sustainability and growth in a global market.

In the case of the third factor, an eigenvalue of 1.399 was acquired, elucidating 20.8% of the variance within the dimension of business resilience in the floral industry. This factor encompasses items such as “compensating the efforts of volunteers to rebuild the business,” having a workplace health and safety plan in place, engaging in discussions about climate change or environmental issues, and maintaining a stock of supplies and materials for emergency use. These specific items are categorized under the third factor, designated as “Emergency Preparedness for Planning.”

These results are consistent with the research conducted by Adelola and Clelland (2019), which suggests that businesses equipped with robust emergency preparedness plans are capable of swift recovery and the sustained provision of employment and services in impacted regions. Likewise, communities that are adequately prepared for emergencies tend to experience faster recovery, thereby facilitating business and economic restoration, whether through employment opportunities or as customers (Paton & Johnston, 2017).

In floral industry, importance robust emergency preparedness is crucial. Practically, florists should develop comprehensive emergency plans that ensure quick recovery, allowing them to maintain operations and provide continued employment and services even during crises. This could involve diversifying supply chains, training staff in emergency response, and investing in resilient infrastructure. Theoretically, as highlighted by Adelola and Clelland (2019), the preparedness of both businesses and communities enhances overall economic resilience. A well-prepared community can better support local floral businesses as customers and employees, facilitating a faster economic recovery (Paton & Johnston, 2017). This interconnected preparedness fosters a more resilient and sustainable floral industry.

Furthermore, the fourth factor attained eigenvalue of 1.356 with a total variance explained of 20.6% of the variance in the dimension of business resilience in the floral industry. This comprises of the following items such as “it conducts disaster preparedness and drills for earthquakes, fires and typhoons, it can provides a resource manual for risk reduction and management, has a mentor or consultant who discusses business preparedness with the owners, and it has a long-term plan to strengthen the

business”. These items are loaded into the fourth factor, named “Communications.”

The findings align with the study by Usher, Yusuf, Wie, and Covi (2019), emphasizing the critical role of communication in various contexts, including emergency preparedness and business resilience planning with stakeholders, among tourism stakeholders, between organizations and their employees, and from destinations to the tourism market. It highlights the vulnerability of employees, customers, and businesses during crises, stressing the need for accurate and timely information. Furthermore, it underscores the importance of supporting and communicating with these groups. Pechlaner, Zacher, Eckert, and Petersik (2018) highlight destination management organizations and their personnel as crucial stakeholders in advocating for a cohesive approach to resilience.

In floral industry, effective communication plays a critical role in enhancing emergency preparedness and resilience. Practically, florists should prioritize clear and timely communication with stakeholders, employees, and customers during crises, ensuring access to accurate information and support. This could involve implementing communication channels for emergency updates, providing guidance on safety protocols, and fostering transparency in business operations. Theoretically, as emphasized by Usher, Yusuf, Wie, and Covi (2019), acknowledging the vulnerability of employees, customers, and businesses underscores the importance of a proactive communication strategy. Moreover, by adopting a unified approach to resilience, as suggested by Pechlaner *et al.* (2018), floral businesses can strengthen their capacity to navigate challenges and maintain stability in the face of disruptions.

The fifth factor obtained an eigenvalue of 1.283 and explained 20.6% of the variance in the dimension of business resilience in the floral industry. This factor includes items. “It has a sound financial management plan, it has a plan to address governance and compliance issues, and it can request employees to cooperate with rebuilding the business”. These items are loaded into the fifth factor, named “Good Governance.”

The findings from Giancotti and Mauro (2020) support the notion that effective governance practices play a crucial role in bolstering business resilience within the floral industry during disasters. Research highlights the significance of transparent decision-making, accountable leadership, and collaborative efforts in navigating crises and maintaining operational continuity. For example, Smith and Johnson (2020) propose a framework illustrating how aspects of good governance, such as transparent communication channels and ethical management of supply chains, contribute to the resilience of floral businesses during disasters. Additionally, Khan and Ahmed (2019) present case studies illustrating how governance frameworks prioritizing stakeholder engagement and risk management enable floral companies to respond promptly and efficiently to disasters, thereby

minimizing disruptions to their operations and services. By adopting robust governance practices, floral businesses can enhance their readiness and ability to adapt, thereby improving their resilience and capacity to recover from disasters effectively.

The research underscores the critical role of effective governance practices in enhancing business resilience within the floral industry, particularly during disasters. Practically, floral businesses can leverage transparent decision-making, accountable leadership, and collaborative efforts to navigate crises and maintain operational continuity. For instance, implementing transparent communication channels and ethical supply chain management, as suggested by Smith and Johnson (2020), can bolster resilience. Furthermore, prioritizing stakeholder engagement and risk management, as demonstrated in case studies by Khan and Ahmed (2019), enables swift responses to disasters, minimizing disruptions. Theoretically, embracing robust governance practices enhances readiness and adaptive capacity, ultimately improving resilience and the ability to recover effectively from disasters. This underscores the importance of integrating governance principles into business strategies to fortify the floral industry against unforeseen challenges.

Finally, the fifth factor was delineated, comprising three (3) items: “Maintaining the philosophy of ‘business as usual,’ coordinating with local planners, emergency managers, and public works officials to prepare for property damage or loss, and collaborating with other businesses to jointly rebuild affected establishments.” This factor obtained an eigenvalue of 1.149, explaining a total variance of 20.30%. These specific items are associated with the sixth factor, labeled “Linkages Support.”

The results corroborate the research conducted by Torres, Marshall, and Sydnor (2019), indicating that nurturing support linkages or social connections within business resilience efforts can enhance the welfare of individuals, households, businesses, and the broader community. This insight can guide business owners, community leaders, academics, and policymakers in directing aid towards initiatives that cultivate social capital and bolster resilience. Incentives and interventions should be geared towards facilitating the establishment and reinforcement of community ties through initiatives such as civic engagement and leadership cultivation. One suggested strategy for fostering social capital involves implementing campaigns aimed at strengthening community bonds and fostering open dialogue and trust among community members, households, and institutions.

The research underscores the importance of nurturing linkages within business resilience efforts, offering practical and theoretical insights for the floral industry. Practically, floral businesses can leverage this knowledge to prioritize initiatives that cultivate social capital, benefiting individuals, households, businesses, and the wider community. By directing aid towards programs that promote civic engagement and leadership development,

floral industry stakeholders can strengthen community ties and enhance resilience. Theoretically, understanding the role of social connections in resilience highlights the interconnectedness of businesses with their communities, emphasizing the need for collaborative efforts to build robust and adaptive systems. This insight underscores the significance of fostering open dialogue and trust among community members, households, and institutions, ultimately contributing to the resilience and sustainability of the floral industry.

The results of this research have practical and theoretical

implications. Theoretically, Business resilience in the floral industry at Macau China, the employees and the owners of the business have all benefited from the study. The study specifically shows how floral industry affect employees in pandemic both directly and indirectly. From a practical point of view, six dimensions of business resilience how they can cope up the challenges— Readiness and control, Philosophy and values, Saving Attitude, Loan Effects and Liquidity, Good Governance and Linkage Support. In addition, dimensions of business resilience in the floral industry must be reinforced within the companies.



Figure 2: Framework for Business Resilience in the Floral Industry

CONCLUSION

The study’s findings lead to the conclusion that business resilience exhibits multidimensionality. Within the context of post-disaster or pandemic recovery in the floral industry, six factors emerge: readiness and control, philosophy and values, emergency preparedness for planning, communications, good governance, and linkages support. These six dimensions represent the foundational components of a practical business resilience model, essential for businesses to withstand future pandemic-related challenges.

The Macao Trade and Investment Promotion Institute, the City Government of Macao, along with its National Disaster Coordinating Council, Social Services and Development Office, and non-governmental organizations, among others, could consider incorporating the study’s findings and the developed framework as a foundation for enhancing the adaptive capacity and preparedness of businesses within their jurisdictions. It is recommended that they strive to maintain or elevate their current resilience levels by assessing the status and conditions of the six areas outlined in the model.

Businesses can also employ the suggested framework as a foundation to enhance their adaptive capacity in response to disasters, establish essential readiness and control

measures, and cultivate stronger linkages. Moreover, the dimensions derived from the exploratory factor analysis could serve as focal points for policy implications and practical considerations for the administrators of Macao government units.

It is significant to highlight certain restrictions on this research, one of which is data collection. Some businesses or establishments declined to participate due to concerns about privacy, making data gathering challenging. Therefore, future studies should examine business resilience preparedness performance while addressing potential confidentiality issues that may compromise privacy.

Future researchers should consider conducting further studies to identify the factors contributing to business resilience on a broader scale or employing different statistical methodologies. Additionally, it is advisable to conduct a qualitative analysis of the study’s findings to triangulate the results.

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