

Resilience in Bali's Accommodation Businesses Amidst the COVID-19 Pandemic: A Survival Analysis

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Abstract: This study aims to estimate the survival rate of the accommodation industry in Bali during the COVID-19 pandemic crisis using a dataset comprising 3,378 accommodations in Bali. Two distinct survival analysis methodologies were employed: the Kaplan-Meier and log-rank tests. This study will also employ a qualitative analysis to examine the cultural characteristics of accommodation business resilience in Bali. Based on the patterns revealed in this research, hotels in operation for the last 10 years will have a 70% survival rate, in contrast with hotels in operation for over 40 years which have a 25% survival rate. This is especially the case of hotels that remain in operation during the COVID-19 pandemic. The initial 15-year period of business operations is identified as a critical juncture. Moreover, a notable discrepancy in survival rates was found across groups defined by specific variables, including the number of rooms, business scale, business typology, and location. Local culture is also discovered to be a crucial factor that enhances business adaptability and community ties, providing resilience.

Keywords: tourism accommodation; kaplan-meier method; tourism crisis; Bali culture.

1. Introduction

The accommodation industry, part of the broader category of hospitality, plays a pivotal role in driving Bali's economy. In 2024 alone, it contributed to 12.16% of the province's GDP (BPS Bali, 2025). Notably, this industry also employs the highest number of tourism workers in Indonesia (BPS Indonesia, 2022). However, the industry is susceptible to crises due to its high fixed costs,

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fixed assets, and leveraged structure (Ozdemir et al., 2021; Wirawan et al., 2020). The COVID-19 pandemic has led to the most significant contraction in its history, with a 41.37% decline in 2020 and an additional 17.05% in 2021, resulting in a total contraction of 51.36% over two years (BPS Bali, 2022). As Bali's economy is heavily dependent on tourism, the province experienced significant economic losses, highlighting the industry's vulnerability to external disruptions. This emphasizes the need for resilience strategies to mitigate future crises and support long-term sustainability.

The COVID-19 pandemic led to widespread hotel closures in Bali, both permanent and temporary. In 2020, 25% of star-rated hotels closed, with the sharpest declines observed in 1-star (-35.29%), 2-star (-29.17%), and 3-star (-28.57%) hotels, while 4- and 5-star hotels demonstrated greater resilience (BPS Bali, 2024a). Non-star accommodations initially increased by 4.98% in early 2020 but declined by 28.37% in 2021 (BPS Bali, 2024b). These closures led to a 24.04% reduction in industry employment, displacing approximately 23,373 workers (BPS Indonesia, 2023). Given the accommodation sector's crucial role in Bali's economy, its susceptibility to crises underscores the importance of examining factors that contribute to its resilience and survival. Fluctuations in business numbers, employment, and output levels demonstrate the industry's susceptibility to external shocks. Understanding these patterns can help businesses develop resilience strategies and inform policies that support long-term sustainability, ensuring the industry can better withstand future crises and economic disruptions (Gémar et al., 2016; Lado-Sestayo et al., 2016).

The extant literature on the resilience of the hotel industry has typically focused on the duration of a hotel's survival from its inception to its exit, with a concomitant focus on the factors influencing this survival. The extant literature on this subject typically employs survival analysis, focusing on factors influencing the duration of a hotel's existence (Escribano-Navas & Gemar, 2021; Gemar et al., 2019; Gémar et al., 2016; Lado-Sestayo et al., 2016; Pelaez-Verdet & Loscertales-Sanchez, 2021; Vivel-Búa et al., 2016, 2019). The majority of these studies utilize survival analysis with substantial hotel samples, frequently drawing upon data from the Iberian Balance Sheet Analysis System (SABI) database for Spanish hotels. Studies on Bali's hotels are limited due to a lack of available data. Furthermore, existing research on hotel survival primarily examines financial crises, such as the global financial crisis and the 2008 Great Recession, as key determinants of hotel resilience and longevity (Gémar et al., 2016; Lado-Sestayo et al., 2016; Pelaez-Verdet & Loscertales-Sanchez, 2021; Vivel-Búa et al., 2019). Crespi-Cladera et al. (2021) explored how the COVID-19 pandemic influenced the financial resilience of hospitality firms, but did not specifically focus on the accommodation industry.

In the context of business resilience, particularly within the hotel industry in Bali, local culture emerges as a pivotal element (Ishwari et al., 2019; Yunita et al., 2024). In the face of crises, such as natural disasters or socio-political upheavals, the survival of these businesses is intricately intertwined with their cultural context. Local values serve as a moral compass, guiding business owners and managers in decision-making that prioritizes the well-being of employees and the community (Sukawati & Jatra, 2015). This collective approach fosters enhanced collaboration within and between organizations, promoting mutual support and resource sharing. Furthermore, local values fosters the development of intangible resources such as trust and social capital, which are crucial in uniting communities and businesses in pursuit of common recovery goals. In contexts where formal structures are deficient, these cultural connections function as a critical safety net, providing a sense of security for businesses (Ishwari et al., 2019).

A number of studies have been conducted in Indonesia on the cultural dimensions of the tourism industry's resilience in the context of crisis management. A case study of non-star-rated accommodation in Yogyakarta emphasizes that local culture is not only a backdrop but an active component that shapes the strategies and resilience of small-scale tourism businesses in the face of adversity (Dahles & Susilowati, 2015). This highlights the importance of considering cultural context when examining business resilience in tourism. Dahles et al. (2020) revealed that robust social networks and communal beliefs influenced business owners' decisions regarding employment and resource allocation during challenging periods. Another study, focusing on the cultural perspective of resilience, particularly in the context of the longevity and sustainability of small industries owned by Sundanese entrepreneurs in Indonesia, found that traditional Sundanese cultural values, such as a strong long-term orientation, collectivism, and specific entrepreneurial behaviors, contribute to the resilience of these small industries across generations (Charina et al., 2022). However, most existing studies have focused on small and medium-scale tourism industries, leaving a gap in understanding how local culture influences resilience across different business scales, including larger tourism enterprises.

This study explores two research questions: (1) How do internal factors, such as business characteristics, affect the survival of accommodations in Bali during the COVID-19 pandemic? (2) How do external factors, such as local culture, influence their resilience and longevity? In order to ascertain the internal factors that contribute to the survival rate of the businesses in question, this study will employ four variables: the number of room categories, the scale of the business, the hotel typologies, and its location. This study also investigates the impact of local culture on the resilience of accommodation businesses in

Bali, including small and medium-sized enterprises as well as larger-scale establishments.

This study is essential for improving operational strategies, promoting economic stability, and deepening the understanding of industry dynamics. An analysis of factors influencing hotel sustainability is crucial for shaping policy and investment decisions, particularly in tourism-dependent economies. As global interconnectedness grows, understanding diverse cultural frameworks is vital for developing sustainable business practices that can withstand disruptions (Yunita et al., 2024). Recognizing how local values and community-oriented approaches enhance resilience allows other regions to adopt similar strategies, fostering collaboration and adaptability (Ishwari et al., 2019). Ultimately, preserving and integrating cultural values not only strengthens local economies but also contributes to global stability and cooperation in an increasingly interconnected world.

2. Literature Review

A review of existing literature reveals a lack of consensus on the theoretical framework for identifying factors that contribute to the failure of accommodation businesses (Barreda et al., 2017). Empirical research identifies various factors influencing business survival, which differ based on context, including location, time period, and methodology. Quantitative studies using statistical models typically focus on internal business variables when examining the resilience of accommodation businesses. These variables fall into two main categories: business characteristics, such as financial conditions, scale, hotel type, and management structure; and external environmental factors, including location, seasonality, market demand, and crises. (Caires et al., 2023; Crespí-Cladera et al., 2021; Cvelbar & Dwyer, 2013; Escribano-Navas & Gemar, 2021; Gemar et al., 2019; Gémár et al., 2016; Lado-Sestayo et al., 2016; Lin & Kim, 2020; Türkcan & Erkuş-Öztürk, 2019; Vivel-Búa et al., 2019, 2016). Conversely, qualitative studies predominantly emphasize the impact of cultural factors on the resilience of accommodation businesses (Astina, 2021; Dahles & Susilowati, 2015; Duartha et al., 2020; Ishwari et al., 2019).

Research indicates that 20%-25% of Spanish hotels close within ten years, while 50% remain operational for over 40 years (Lado-Sestayo et al., 2016). In Turkey, 85% of tourism firms survive five years, while around 65% survive beyond ten years and the probability of survival throughout the entire period analyzed (2000-2016) is only approximately 40% (Türkcan & Erkuş-Öztürk, 2019). In Portugal, younger tourism firms are more likely to exit the market, while older firms demonstrate greater resilience (Caires et al., 2023). Furthermore, hotel size exerts a significant influence on survival rates, with micro-hotels

demonstrating lower longevity in comparison to small and medium-sized establishments. Vivel-Búa et al. (2019) found that micro-hotels exhibited a 50% probability of survival over a 30-year period, contrasting with over 70% for medium-sized hotels and 65% for small hotels. This phenomenon can be attributed to the fact that larger hotels possess the financial and operational resources to withstand competitive pressures and market fluctuations (Ingram & Baum, 1997). The hotel rating system also exerts an influence on survival rates. Five-star hotels have been observed to experience lower failure rates due to their superior quality and reputation (Ingram & Baum, 1997). However, Gemar et al. (2019) and G  mar et al. (2016) contend that the typology of the hotel does not significantly impact survival rates. The role of location in hotel resilience is particularly pronounced in regions where tourism is spatially concentrated (Caires et al., 2023; G  mar et al., 2016; Lado-Sestayo et al., 2016; Vivel-B  a et al., 2016, 2019). In underdeveloped areas with limited accessibility, hotels may face challenges in attracting demand and maintaining viability, underscoring the importance of strategic site selection and infrastructure development.

Research on the link between resilience and Balinese local culture in the hotel industry remains limited, though several studies highlight its significance (Astina, 2021; Ishwari et al., 2019; Sukawati & Jatra, 2015; Yunita et al., 2024). Ishwari et al. (2019) emphasize the role of the Tri Hita Karana (THK) philosophy in fostering business resilience by strengthening customer relationships, community involvement, and organizational behavior. Local culture acts as a stabilizing force during crises, enabling businesses with strong cultural identities to better navigate economic downturns and shifting traveler preferences (Duartha et al., 2020). Astina (2021) further contends that Balinese culture is not merely an ancillary aspect but rather a fundamental pillar of resilience in the hospitality sector. These findings suggest that embedding cultural values within business operations enhances adaptability and long-term sustainability, positioning Balinese hotels with strong cultural identities as more resilient amid industry uncertainties. Sukawati & Jatra (2015) identify three key elements of Balinese hospitality culture: product features, including historical settings, Balinese architectural design, and locally sourced materials; service aspects, such as personalized guest experiences, flexibility, integration within the *banjar* system, and strong communal ties; and image components, emphasizing socio-cultural engagement, guest connection with the hotel, and the infusion of spiritual values. The integration of these cultural dimensions fosters business resilience by cultivating authenticity, community involvement, and adaptability within Bali's hospitality sector.

As discussed in the previous section, existing research highlights several key factors that influence the survival of accommodation businesses during

times of crisis. This study focuses on four internal factors: the number of rooms, business scale, accommodation type, and location. Based on these factors, it tests four hypotheses regarding differences in survival rates among accommodation businesses. Additionally, the study examines the role of external influences, particularly Balinese local culture, in shaping the resilience of the hotel industry. The impact of local culture is analyzed through its influence on the product, service, and brand image of accommodation businesses.

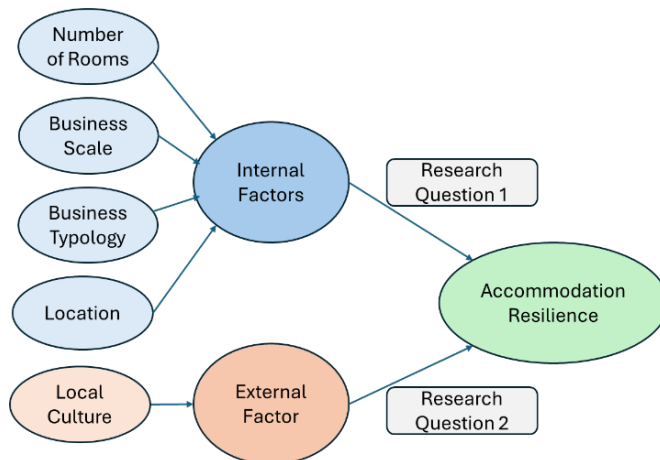


Figure 1. Conceptual Framework (Source: Authors)

3. Method and Theory

3.1 Method

This study employs a mixed-method approach, integrating quantitative analysis using data from the provincial *Badan Pusat Statistik* (BPS) Bali Statistics and qualitative insights from semi-structured interviews. The research focuses on short-term tourism accommodation businesses across Bali's nine districts, encompassing hotels (starred and non-starred), villas, guest houses, homestays, and similar establishments. These businesses are categorized under the five-digit industrial classification code as provided by the *Klasifikasi Baku Lapangan Usaha Indonesia* (KBLI) within the Accommodation, Food, and Drink Provision industry (see Appendix 2). The study utilizes data from the 2021 Updating of Accommodation Service Business Survey (Updating-VHTL) by BPS Bali, covering 3,449 businesses, of which 3,378 were analyzed after excluding missing, duplicate, or out-of-scope records. The data were collected through the administration of an electronic questionnaire, employing the Computer-Assisted Personal Interviewing (CAPI) method, a technique whereby the respondent or interviewer employs computer-aided devices, including notebooks, laptops, tablet PCs, or smartphones, for responding to questions within the questionnaire. The key variables include business identity, activity status, classification,

establishment year, room capacity, legal entity status, business scale, and geotagged locations. This comprehensive dataset provides a robust foundation for examining resilience in Bali's tourism accommodation sector.

This study employs survival analysis to examine time-to-event data, such as the duration from the start of an accommodation business to its closure (Jenkins, 2004). The event of interest is the business's failure to survive. "Censored data" refers to instances where the event time is unknown or does not occur within the observation period, specifically right-censoring in this study. The study also considers the establishment times of businesses and uses 2021 as the observation endpoint (type III censored data). Survival analysis utilizes two main functions: the survival function, which shows the probability of a business surviving beyond a certain time, and the hazard function, which indicates the likelihood of failure at a specific time. The Kaplan-Meier method estimates the survival function, assuming censored data is independent of survival time (Kleinbaum & Klein, 2012). The survival curve is a graphical representation of the relationship between the estimated survival function at a given time (t) and the survival time. The estimated survival function can be formed into the following equation:

$$\hat{S}(t_{(j)}) = \hat{S}(t_{(j-1)}) \times \hat{Pr}[T > t_{(j)} | T \geq t_{(j)}]$$

Where :

$\hat{S}(t_{(j)})$: cumulative probability for survival time at time j

$\hat{Pr}[T > t_{(j)} | T \geq t_{(j)}]$: survival probability for time greater than j if this probability occurs more than or at time j .

Moreover, the results of the Kaplan-Meier survival curve estimation are compared to ascertain whether there are differences between survival curves within each category or data group. This is achieved through the use of the Log-rank test. This test is a non-parametric statistical analysis employed when the data is asymmetrical or skewed to the right. The null and alternative hypotheses used for the log-rank test are as follows:

H0: There is no difference between groups/categories on the survival curve.

H1: There is a difference between groups/categories on the survival curve.

The test statistic used in the Log Rank test is formulated as the following:

$$X^2_{count} = \sum_{g=1}^G \frac{(O_i - E_i)^2}{E_i}$$

where:

O_i : observed value of accommodation business in the i -th group

E_i : expected value of accommodation business in the i -th group

G : number of groups

i : 1, 2, ..., G

The test criteria used are if the Log Rank statistic (X^2_{count}) is greater than $X^2_{\alpha,df}$ with degree of freedom (df) equal to (G-1), thus the null hypothesis (H0) will be rejected at the α percent confidence level. The study's data were analyzed using a Statistical Package for the Social Sciences (SPSS), with survival analysis comprising the Kaplan-Meier method and the log-rank test.

This study's qualitative component adopts the expert panels technique, with data collected through semi-structured interviews. The expert panelists are Balinese with a strong background in hospitality business and minimum of 20 years of experience in the tourism industry (see Appendix 1). The study employs a written interview format with open-ended questions, allowing respondents to provide detailed responses. This approach ensures more precise data collection and enables researchers to conduct a more thorough evaluation of participants' answers (Sugiarto et al., 2023). The interview posed questions such as the prevailing state of accommodation businesses amidst various tourism crises, the manner in which Balinese local culture influences accommodation businesses with regard to their products, services, and business image, the extent to which Balinese local culture impacts the resilience of businesses in challenging circumstances, and the manner in which accommodation businesses in Bali contribute to the preservation of local culture.

After conducting interviews with six panelists, no new information or themes emerged, indicating that sufficient data had been collected. As a result, no further interviews were conducted. Each interview lasted between 30 minutes and one hour and was recorded for documentation. Furthermore, qualitative data analysis is carried out in four stages (Ihalauw et al., 2023). First, the interview results are reviewed, and then they are transcribed as text. Next, data reduction is carried out by selecting, organizing, and grouping relevant information. Then, data re-examination is carried out to ensure accurate interpretation. Finally, data interpretation is carried out by explaining the patterns found.

3.2 Theory

3.2.1 Resilience

Resilience theory, introduced by C.S. Holling in 1973, explains a system's ability to withstand and recover from disturbances. It defines two types of stability: equilibrium-based, where a system remains fixed, and resilience-based, where a system adapts and recovers from change. Applied to economic systems, resilience theory recognizes their susceptibility to sudden disruptions like financial crises and climate change (Holling, 1973). A resilience-based management approach enhances stability by promoting diversification,

flexibility, and adaptive capacity. Key strategies include strengthening economic diversity, fostering adaptability and transformation, encouraging community participation in decision-making, and mitigating risks that threaten stability. By integrating these principles, economic systems can better endure crises and recover more effectively, ensuring long-term sustainability.

The concept of resilience has garnered significant attention in research across various countries and disciplines. This theory pertains to an individual's or a group's capacity to overcome adversity or trauma while maintaining functionality. Resilience theory underscores the processes of adaptation and recovery from stress or trauma, along with the factors that influence an individual's ability to persevere in challenging circumstances (Van Breda, 2018). While the original focus of resilience theory was on the human condition, several studies have demonstrated its relevance to economic entities as well. Research has shown that more resilient organizations tend to demonstrate a greater ability to survive difficult situations and adapt to rapid environmental changes. However, it should be noted that the application of resilience theory to economic entities is still in the development stage and requires further research to be firmly established (Van Breda, 2018).

3.2.2 *Resilience of Tourism Organizations*

Organizational resilience is an organization's ability to endure, adapt to, and recover from disruptions (Burnard et al., 2018). It entails risk management, system resilience, and learning from failure in order to develop dynamic skills (Melián-Alzola et al., 2020). Adaptability, quick decision-making, continual learning, stakeholder interactions, long-term vision, innovation, and resource accessibility are all important traits (Prayag, 2023). In the context of tourism, organizational resilience is described as a company's ability to adapt to a changing environment, including uncertain and disruptive conditions like disasters or crises (Prayag et al., 2023). The concept of tourism resilience encompasses the industry's ability to withstand and recover from significant stressors or pressures, as well as the development of novel resources and adaptation and transformation processes that enable the tourism industry to overcome challenges (Tibay et al., 2018).

Tourism resilience depends on their ability to adapt to disruptions, recover from uncertainty, and evolve beyond prior states (Melián-Alzola et al., 2020). Given the complexity of the tourism industry, which includes accommodation, food, attractions, transportation, and services, resilience is a dynamic process that necessitates ongoing adaptation. These enterprises are subject to a variety of internal and external factors, such as competition, seasonal demand, environmental changes, and political instability. The ability

to effectively coordinate and strategize is critical to the management of these difficulties. Tourism organizations must build resilience strategies to overcome crises such as natural disasters or economic downturns while maintaining long-term stability and operational effectiveness (Melián-Alzola et al., 2020). In the context of this paper, resilience refers to the ability of accommodation businesses in Bali to adapt and endure (survive) during crises, especially the COVID-19 pandemic, by leveraging local cultural strengths, fostering community support, and implementing effective recovery strategies. It goes beyond having a crisis management plan; it encompasses the effectiveness and comprehensiveness of these plans, which must consider the organization's size, resources, and geographical location (Pennington-Gray et al., 2010).

3.2.3 *Tourism Crisis Management*

A crisis is an unanticipated incident that jeopardizes the stability, security, or survival of an organization or society (Buhalis & Costa, 2006; Glaesser, 2003; Henderson, 2007; Morozov, 2020). Natural disasters, terrorist attacks, political conflicts, and disease epidemics are all examples of how it might manifest. In management, a crisis necessitates urgent action to prevent negative effects on operations, money, and reputation. Effective crisis management entails strategic planning, coordination, and execution in order to limit harm and maximize recovery. Tourism crises jeopardize the industry's long-term viability, disrupt locations, and have an impact on stakeholders. They can result in reduced tourist numbers, financial losses, and reputational harm (Henderson, 2007).

Tourism crisis management is defined as the identification, prevention, management, and restoration of crises within the tourism sector (Glaesser, 2003; Pforr, 2006). The core objective of tourism crisis management is to mitigate adverse repercussions on tourism enterprises, destination reputations, and local economies. Key components of tourism crisis management include the following: risk identification, response planning, staff training, and periodic testing of crisis plans. Collaboration among stakeholders—government, tourism industry, media, and local communities—is crucial for effective response and rapid recovery (Glaesser, 2003; Pforr, 2006; Ritchie & Campiranon, 2015). Tourism crisis management is closely linked to industry resilience, defined as the ability to survive and recover from crises, including natural disasters, terrorist attacks, and health crises (Glaesser, 2003; Pforr, 2006; Ritchie & Campiranon, 2015). The implementation of effective crisis management has been shown to enhance resilience, foster trust, and strengthen the tourism industry's reputation through professionalism and transparency, ensuring long-term stability (Glaesser, 2003).

4. Results and Discussion

4.1 Survival Analysis of Accommodation Businesses in Bali

The first objective of this study is to determine the survival rate and identify any disparities in survival rates between groups based on particular criteria, such as the number of rooms, business scale, business type, and location of Bali accommodation establishments during the COVID-19 crisis. The data indicate that the mean survival time of the 3,378 number of accommodation businesses under consideration was approximately 11 years (as of 2021), with a maximum of 94 years (Table 1). In addition, the average number of rooms owned by Bali lodging establishments is 24, with a minimum of 1 room and a maximum of 841 rooms.

Table 1. Descriptive Statistics

No	Variable	N	Minimum	Maximum	Mean	Std. Deviation
1.	Survival Status	3378	0	1	0,36	0,479
2.	Survival Time	3378	1	94	10,92	8,794
3.	Number of Room	3378	1	841	23,89	55,064

Source: Author calculation using SPSS 25 program

The results of the study indicate that approximately 64% of lodging establishments in Bali were able to maintain operations during the pandemic (COVID-19) or were designated as “censored data” (Figure 1). During that time, the remaining companies temporarily or permanently stopped operating; this information is called event data. The majority of lodging establishments in Bali have been in operation for six to ten years. In addition, 22% of lodging establishments have been running for 11 to 20 years, compared to 25% open for fewer than five years. A mere 1% of these enterprises have sustained their operations for over 40 years, as in 2021.

In terms of the number of rooms owned by business accommodation establishments in Bali, the majority have fewer than 10 rooms (57%), with accommodation comprising 11–50 rooms representing the next largest category (32%) (Figure 1). The accommodation business in Bali is dominated by micro and small enterprises, which account for 73% of the total sample. In terms of business accommodation typology in Bali, approximately 1,219 establishments are classified as villas (KBLI code: 55194), followed by 773 as homestays (KBLI code: 55130). Additionally, the star hotel category represents approximately 12% of the total sample. In terms of location, the majority of tourism accommodation businesses in Bali are concentrated in the southern region, particularly in the Badung and Gianyar districts (Figure 2). Approximately 65% of accommodation

businesses are situated in these two districts. The density of accommodation businesses is particularly evident in the southern part of the Badung district, with a concentration of accommodation in the Kuta, Legian, and Nusa Dua areas. Conversely, the density of accommodation businesses in the Gianyar district is located in the Ubud area.

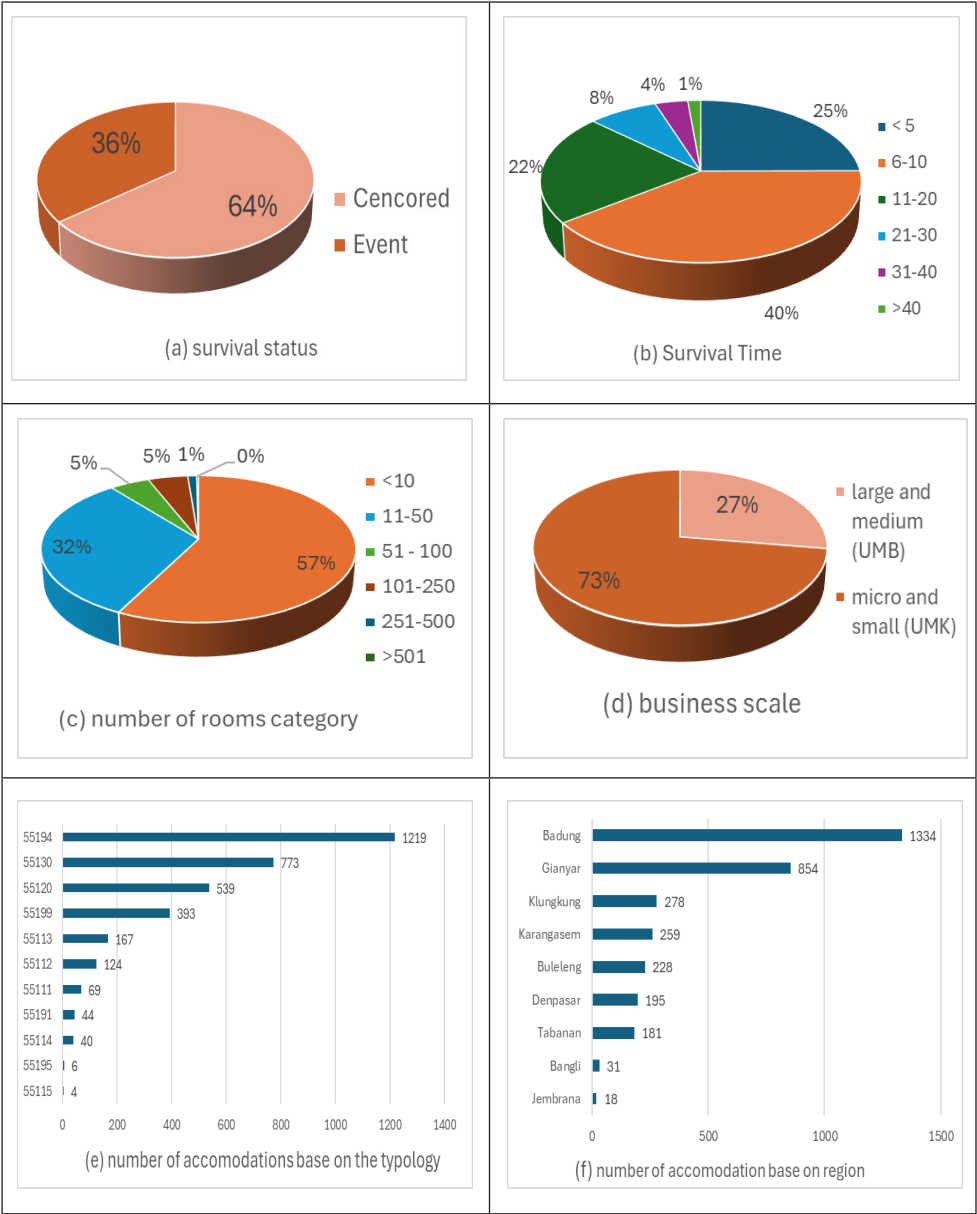


Figure 1. Descriptive Statistics (Source: Author calculation using SPSS 25 program).

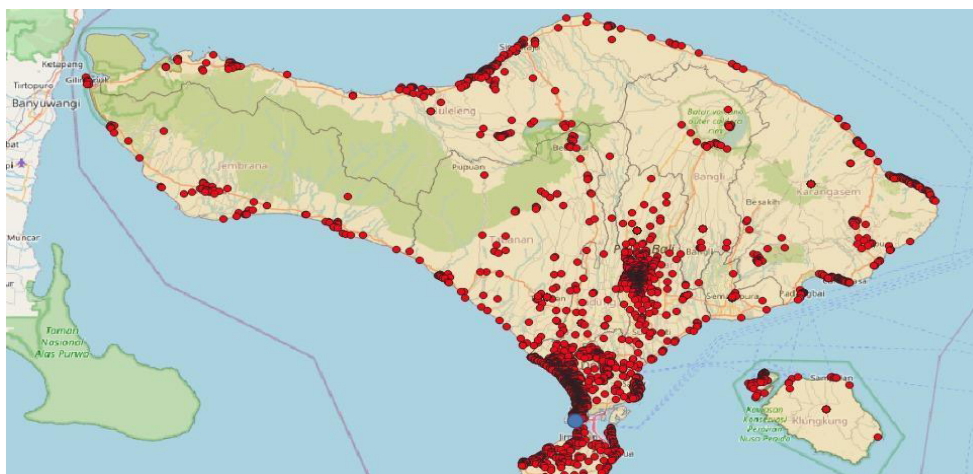


Figure 2. The Distribution Of Accommodation Businesses In Bali (Source: Author calculation using QGIS 3.36.0 program).

Based on the estimation of survival curve (Figure 3), accommodation businesses in operation for the last 10 years will have a 70% survival rate, in contrast with hotels in operation for over 40 years which have a 25% survival rate. This is especially the case of hotels that remain in operation during the COVID-19 pandemic. The initial 15-year period of business operations is identified as a critical juncture, with the survival rate declining to 55%. Additionally, the findings indicate that only 50% of Bali's accommodation businesses are able to withstand two decades of operation. As the operational duration extends beyond this initial phase, the survival rate exhibits a gradual decline. For instance, the approximate survival rates for 30-year and 40-year operational periods are 35% and 25%, respectively.

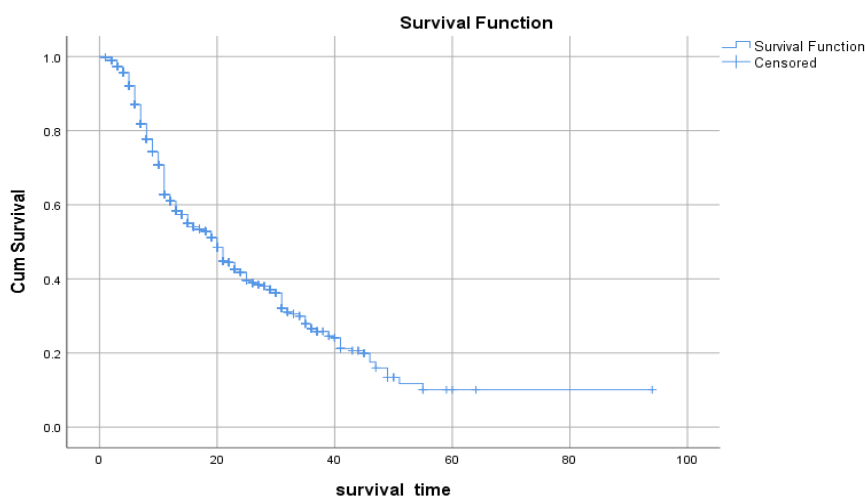


Figure 3. Kaplan-Meier Survival Curve Estimation of Bali's Accommodation Business (Source: Author calculation using SPSS 25 program)

The number of rooms owned by accommodation businesses in Bali has been found to correlate with varying rates of business survival during the COVID-19 pandemic. The data indicates that businesses with fewer than 10 rooms exhibit the lowest survival rate. The estimated survival rate for accommodation businesses in this group is 65% over a ten-year period (Figure 4). This indicates that only 35% of businesses with less than 10 rooms are unlikely to survive for a decade. In contrast, businesses with 51-100 rooms appear to demonstrate a higher probability of long-term survival, with an estimated 80% chance of remaining operational for at least ten years. The research findings also indicated that accommodation facilities with fewer than 10 rooms exhibited a nearly 30% survival rate over a 30-year period. In comparison, accommodation facilities with between 101 and 250 rooms exhibited an estimated survival rate of approximately 50% over a 30-year period. Furthermore, accommodation facilities with 251-500 rooms demonstrated an estimated survival rate of approximately 70% over a 25-year period.

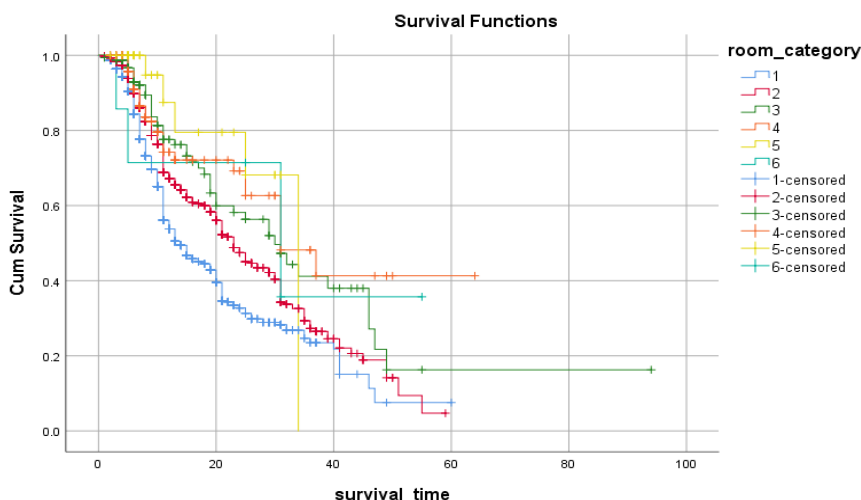


Figure 4. Kaplan-Meier Survival Curve Estimation of Bali's Accommodation Business Base on Room Categories (Source : Author calculation using SPSS 25 program)

Moreover, it was noted that distinct survival rates were observed among accommodation businesses in accordance with the scale of their operations during the period of the COVID-19 pandemic. The data indicated that medium and large-scale accommodation businesses exhibited a higher survival rate than micro and small-scale accommodation businesses. However, in the shorter period of less than five years, the difference in survival rate between the two is relatively minimal. The survival rate for five-year operations is 95% for medium – large accommodation and 90% for micro – small accommodation (Figure 5).

In contrast, a relatively larger discrepancy in survival rate is observed over the 10-to-25-year period. The probability of medium-scale businesses surviving for 10 years was estimated at nearly 80%, while micro and small businesses were estimated at 50% over the same period. Furthermore, the survival rate for longer periods, such as 35 years, was found to be relatively similar for both, with medium and large-scale businesses estimated at nearly 30% and micro and small-scale businesses at 25%.

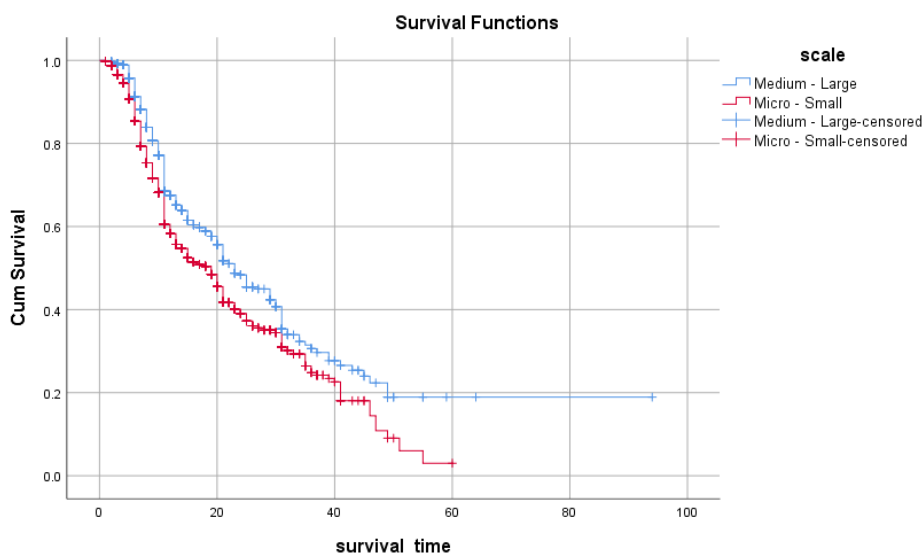


Figure 5. Kaplan-Meier Survival Curve Estimation of Bali's Accommodation Business Base on Business Scale (Source: Author calculation using SPSS 25 program)

A further finding based on the typology of accommodation businesses in Bali during the COVID-19 pandemic was that there were differences in survival rates between the various types of business. Over the course of a decade, 5-star hotels (KBLI code 55111) are projected to exhibit the highest survival rate, followed by 4-star hotels (KBLI Code 55112) and 3-star hotels (KBLI code 55113), which are estimated to have a 90%, 85%, and 80% survival rate, respectively (Figure 6). During the same period, non-star hotels (KBLI code 551120) exhibited a superior survival rate compared to 2-star hotels (KBLI code 55114) and 1-star hotels (KBLI code 55115), with an estimated survival rate of approximately 80%.

In terms of the number of establishments, villas (KBLI code 55194) and homestays (KBLI code 55130) represent the majority of accommodation businesses in Bali. However, they are found to have a lower survival rate compared to hotels with a higher star rating. Specifically, the survival rate of villas over a 15-year operating period is close to 40%, while for homestays, it

is 60%. Additionally, Kaplan-Meier survival curve estimates for longer periods show that the probability of surviving for 25 years is 75% for five-star hotels, 60% for three-star hotels, 50% for non-star hotels, 45% for homestays, and 20% for villas.

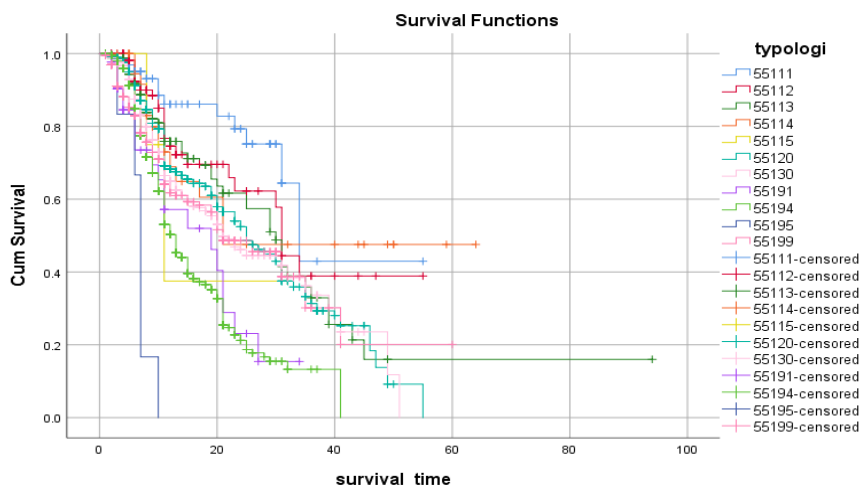


Figure 6. Kaplan-Meier Survival Curve Estimation of Bali's Accommodation Business Base on Accommodation Typology (Source: Author calculation using SPSS 25 program)

Bali comprises nine districts, as follows: Jembrana, Tabanan, Badung, Gianyar, Klungkung, Bangli, Karangasem, Buleleng, and Denpasar. In the short term, the survival rate of accommodation businesses during the COVID-19 pandemic is generally not significantly different between districts (Figure 7). However, over time, there is a notable discrepancy in the survival rate between districts in Bali. The survival rate of accommodation businesses in each city district is recorded at more than 90%, with the exception of Klungkung and Buleleng districts. In the critical phase of 15 years of operation, the survival rate of accommodation businesses is expected to decline to below 50%. However, three districts have been identified with a survival rate above 75% during this period: Tabanan, Gianyar, and Karangasem. It is noteworthy that, over longer periods such as 35 years, accommodation businesses located in Karangasem and Gianyar regencies have demonstrated relatively high survival rates during the crisis, reaching 70% and 50%, respectively.

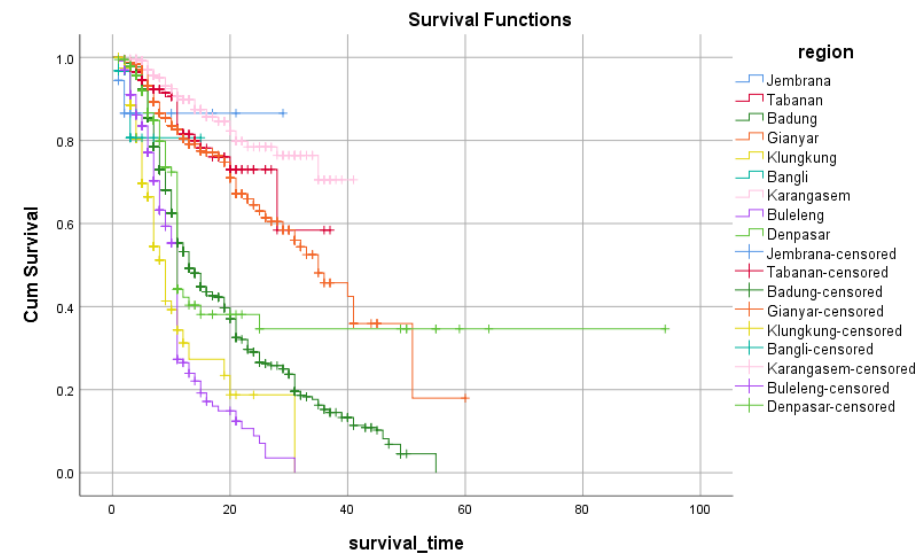


Figure 7. Kaplan-Meier Survival Curve Estimation of Bali’s Accommodation Business Base on Location (Source : Author calculation using SPSS 25 program)

The Log-Rank statistical test is used to determine whether survival rates differ significantly across different categories of data. The analysis of accommodation businesses in Bali, based on factors such as the number of rooms, business scale, typology, and location, shows clear variations in survival rates. The results indicate significant differences between the survival curves of each category within these variables (Table 2). The results confirm the previously stated hypotheses, indicating that factors such as the number of rooms, business scale, accommodation type, and location significantly affect the survival chances of lodging establishments in Bali during the COVID-19 pandemic .

Table 2. Test of Equality of Survival Distributions (Log-Rank Test)

No	Variable	Chi-Square	df	Sig.
1.	Number of rooms	78,65	5	0,00
2.	Accommodation type	155,04	10	0,00
3.	Business scale	24,55	1	0,00
4.	Location	485,97	8	0,00

Source: Author calculation using SPSS 25 program

4.2 The Cultural Characteristics of Accommodation Business Resilience in Bali

4.2.1 Local Culture Sustains Business Resilience

Local culture plays a crucial role in ensuring the survival of Bali's accommodation businesses during crises such as the COVID-19 pandemic. Business owners who integrate cultural values into their operations create a unique competitive advantage, strengthening resilience. A key example is a long-established family-owned hotel in Sanur that has thrived for over six decades by embedding cultural elements into its daily operations. These practices not only attract guests but also foster strong community ties, which provide support during challenging periods. The ability to adapt while maintaining cultural identity helps businesses sustain operations even amid economic downturns. As one hotel owner stated,

"That's where the local wisdom comes in, the value added. That's where it comes in, so it is indeed one of the key factors, and it has to be maintained if it is to survive." (TS, personal interview, January 25, 2025).

Another interviewee emphasized the role of cultural elements such as clothing and flower offerings of *canang sari* in enhancing the provision of a "thick Balinese aura" (AP, personal interview, January 17, 2025).



Photo 1. A hotel in Seminyak Beach survived the COVID-19 pandemic; photo taken September 2022 (Photo by Darma Putra)

4.2.2 Local Culture Strengthens Community and Workforce Stability

The resilience of Bali's accommodation sector is also reinforced by the local workforce, which is deeply rooted in Balinese traditions. Many businesses employ a majority of Balinese staff, whose cultural values shape workplace

interactions and foster a collective sense of responsibility. Practices such as making *rarapan* offerings and participation in temple ceremonies create a shared identity that strengthens internal cohesion. This cultural integration fosters employee loyalty and commitment, reducing turnover and ensuring operational stability even in times of crisis (GA, group interview, January 20, 2025). The cultural attachment between businesses and local communities also fosters resilience. A long-established hotel manager noted,

“Hospitality in Bali is rooted in genuine, heartfelt interactions, where guests are treated as friends rather than as figures of authority, as was common in the past. The traditional notion of “the guest is king,” prevalent in the 1990s, has shifted towards a more personal and welcoming approach. Visitors are now seen as friends coming to visit, reflecting an essential aspect of Balinese culture” (AP, personal interview, January 17, 2025).

4.2.3 Cultural Hospitality Enhances Customer Loyalty

Balinese hospitality, deeply embedded in local culture, contributes to the resilience of accommodation businesses by fostering strong guest relationships. Employees are trained to approach guests as friends rather than customers, creating a personalized experience that encourages repeat visits. This culturally driven service model enhances guest satisfaction and builds long-term customer loyalty, which serves as a buffer during economic downturns. Many long-standing accommodation businesses in Bali attribute their survival to their ability to create meaningful guest experiences rooted in Balinese traditions. A hotel manager explained,

“If service to the guest comes from the heart, they feel like they are visiting a friend's home, not just staying at a hotel. This is part of Balinese culture.” (AP, personal interview, January 17, 2025).

Furthermore, cultural engagement helps sustain businesses by fostering repeat visits. As a manager of the oldest hotel in Bali explained,

“The cultural element is crucial in differentiating hotels from others. The goal is to provide guests with a unique experience that goes beyond standard hospitality, offering deeper cultural immersion and a greater sense of comfort.” (WS, personal interview, January 17, 2025).

4.2.4 Cultural Identity as a Market Differentiator

The distinctiveness of Balinese culture provides a competitive edge that strengthens business resilience. Unlike generic accommodations, businesses that emphasize local identity through architecture, rituals, and cultural

activities offer guests a unique experience that cannot be replicated elsewhere. This differentiation enhances market positioning, attracting travelers seeking authenticity. Even in times of crisis, culturally integrated accommodations tend to retain a loyal customer base, ensuring continued operations.



Photo 2. Built in 1956, a locally owned hotel in Sanur survived the COVID-19 and remains among the best on Sanur Beach (Photo by Ni Made Inna Dariwardani, January 2025).

Additionally, businesses that actively support local cultural events and ceremonies strengthen their ties with the community, creating goodwill that enhances resilience. A chairman of hotel association highlighted,

“That is the ideal approach, though I cannot influence all entrepreneurs in Bali. However, even on a small scale, such as in Ubud, fostering this atmosphere can set an example for others. For me, what I receive is a responsibility—a debt I must give back to the community and environment” (TS, personal interview, January 25, 2025).

All interviewees concurred that local Balinese culture is a significant factor in the survival of accommodation businesses in Bali. However, one interviewee pointed out that for upper-medium-scale businesses, survival often depends on management decisions rather than cultural integration.

“If we look at businesses today, they can be categorized into upper-middle and lower-middle levels. In terms of local culture, smaller and micro-scale businesses tend to be more resilient. However, for local businesses operating at the top level, survival is more challenging due to management difficulties. There are relatively few Balinese entrepreneurs who sustain success at the highest level. On the other hand, small and

lower-middle-level businesses managed by locals continue to thrive and demonstrate strong resilience” (TS, personal interview, January 25, 2025).

Overall, Bali's local culture is not merely a background feature but an active force in shaping business resilience. By embedding cultural values into their operations, accommodation businesses foster community support, workforce stability, guest loyalty, and market differentiation—key factors in long-term survival.

4.3 Discussion

The findings of this study indicate that the survival rate of accommodation businesses is closely linked to the number of rooms they own. In the long term, businesses with fewer than 10 rooms have the lowest survival rate, whereas those with 251–500 rooms have the highest. Additionally, medium- and large-scale accommodation businesses show greater resilience compared to micro- and small-scale enterprises throughout the observation period. Although villas dominate Bali's accommodation sector, they have the lowest long-term survival rate among all accommodation types. In contrast, five-star hotels exhibit the highest survival rate over the same period. Geographically, accommodation businesses in Gianyar and Karangasem demonstrate stronger long-term survival rates compared to those in other regions of Bali.

A limited number of studies have been conducted on the resilience of the hospitality industry, particularly with regard to the survival time of hotels in Indonesia, including those in Bali. This scarcity of research has resulted in a distinct lack of benchmarks for the industry's survival time in Indonesia. The findings of this study indicate that 70% of accommodation businesses in Bali were able to survive for a decade despite facing crises. In comparison, a study by Lado-Sestayo et al., (2016) found a slightly higher survival rate, estimating that approximately 75-80% of hotels in Spain could survive for a 10-year period. Moreover, 50% of hotels in Spain could survive for more than 40 years. However, the findings of this study differ from those previously reported, with the estimated survival rate of accommodation businesses in Bali for a 40-year period approximately being 25%.

It is noteworthy that, in contrast to the study by Lado-Sestayo et al. (2016) which focused exclusively on hotels, this study encompasses a more expansive range of short-term accommodation businesses. However, both studies concur in identifying a critical operational period for accommodation businesses, with both finding that the 15-year marks a critical point in operations. During the initial 15-year period, hotels encounter considerable challenges and a rapid

learning curve, which can result in elevated risks of closure. Nevertheless, those that successfully navigate this period often cultivate a loyal customer base, adapt to market shifts, and invest in essential renovations and upgrades. By this point, hotels that have survived are typically better equipped to manage operations efficiently and respond to competitive pressures, significantly enhancing their chances of long-term viability.

The findings of this study indicate that there are notable discrepancies in survival rates across groups defined by specific variables, including the number of rooms, business scale, business typology and location (region). This may be an initial indication that these variables could influence survival rates, though further study is necessary to confirm this hypothesis.

This study confirms that hotel size and typology influence survival rates, aligning with Ingram & Baum (1997). However, it contrasts with G  mar et al. (2016), who argued that typology does not affect business resilience. Vivel-B  a et al. (2019) found that micro, small, and medium-sized hotels in Spain had different survival rates over 30 years—50%, 70%, and 65%, respectively. Similarly, this study found that micro and small accommodations in Bali had lower long-term survival rates, with only 25% lasting beyond 35 years. Additionally, business size, typology, and scale reflect cultural factors that contribute to resilience. Larger businesses or those with diverse accommodation types may be better at integrating cultural elements, improving customer experience, and gaining a competitive edge, which can strengthen their ability to withstand crises.

As previously demonstrated by G  mar et al., (2016), Lado-Sestayo et al., (2016), Vivel-B  a et al. (2016, 2019), and Caires et al., (2023), the location of a business accommodation has a significant impact on its survival rate. This study revealed a considerable discrepancy in the survival rate over an extended period between different regencies. Gianyar regency demonstrated the highest survival rate among other regions in Bali over the long term. The Ubud area, which is predominantly composed of accommodation businesses, is a developed tourism area and the epicenter of Balinese cultural activities. Accommodation businesses situated in culturally rich areas have benefited from stronger community ties and local support, which can provide critical resources and networks during challenging times to support their resilience.

This study also highlights the crucial role of cultural characteristics in strengthening the resilience of Bali's accommodation businesses during crises. Integrating local values fosters strong community ties and support networks. Prior research (Astina, 2021; Duartha et al., 2020; Ishwari et al., 2019) emphasizes that local culture enhances customer relationships, employee adaptability, and business stability amid market fluctuations. Cultural engagement enriches guest experiences, builds trust, and differentiates businesses in a competitive

market. Thus, embedding local culture in business strategy is key to resilience, warranting further exploration of its impact on long-term sustainability.

5. Conclusion

This study sheds light on Bali's accommodation industries' resiliency during the COVID-19 pandemic. It emphasizes the importance of aspects such as number of rooms, business scale, accommodation type, and location in ensuring long-term stability, assisting hotel owners in refining their strategy. The study also underlines the importance of local culture in resiliency, demonstrating how incorporating customs and traditions develops community bonds, improves guest experiences, and fosters consumer loyalty. These findings provide policymakers with suggestions on strategic expenditures that help firms of varying sizes and types while also promoting cultural integration. The tourism sector can better endure future crises by implementing regulations that promote resilience and sustainability, while still maintaining Bali's distinctive cultural legacy.

According to the patterns revealed in this study, hotels in operation for the last ten years will have a 70% survival rate, compared to hotels in operation for more than 40 years, which would have a 25% survival rate. This is especially true of hotels that continue to operate during the COVID-19 pandemic. The first 15 years of business operations are viewed as a significant stage with the survival rate declining to 55%.

Businesses with fewer rooms have lower survival rates, while those with more rooms are more resilient, especially during the pandemic COVID-19. Medium and large-scale businesses also outperform micro and small-scale ones, with their survival gap widening between 10 and 25 years before stabilizing. Five-star hotels have the highest 10-year survival rate, followed by four- and three-star hotels, while one- and two-star hotels perform worse than non-starred hotels. Villas and homestays, despite their market dominance, struggle with long-term sustainability compared to star-rated hotels.

Geographically, long-term survival is not necessarily higher in major tourist hubs like Badung and Denpasar. Statistical analysis using the log-rank test confirms significant survival differences based on number of rooms, business scale, accommodation type, and location. However, as the test does not establish causality, further research is needed to determine the factors influencing survival rates.

Local culture is not just a backdrop for business but a dynamic force that enhances a hotel's resilience, particularly in a tourism-dependent economy like Bali. It helps regional hotel owners navigate challenges, engage meaningfully with guests, and contribute to the long-term sustainability of Bali's tourism

industry. By integrating local traditions with modern business practices, hotel operators can strengthen their businesses while enriching the community, fostering mutual growth in an ever-evolving environment. This synergy between culture and business creates a strong foundation for resilience, benefiting both local operators and the broader economic ecosystem. However, further research is needed to assess how local culture impacts the resilience of accommodation businesses across different scales and management structures.

This study contributes to the extant literature on organizational resilience in the accommodation sector by emphasizing longevity as a key resilience metric, challenging Prayag et al. (2023), who focus on how dynamic capabilities enable rapid crisis responses, such as during the COVID-19 pandemic. The study underscores the significance of factors such as room count, business scale, accommodation type, and location in determining survival, illustrating resilience as both reactive and proactive. The findings suggest that effective resilience strategies necessitate long-term planning, structural considerations, and market positioning. Furthermore, the study emphasizes the significance of local culture in fostering resilience, proposing that businesses integrating cultural elements can establish stronger customer and community ties, thereby enhancing stability. This proposition challenges prevailing theories that neglect cultural dynamics in resilience frameworks. These theories, such as Holling's resilience theory, emphasize financial stability and operational efficiency without considering local cultural contexts. By integrating cultural and structural factors, this research proposes a multifaceted approach to resilience, demonstrating that sustained success in crisis-prone environments is contingent on long-term strategies, contextual awareness, and cultural engagement.

This study highlights key insights into the resilience of Bali's accommodation businesses but has limitations. The reliance on qualitative interviews may introduce bias, and Bali's unique cultural and economic context limits generalizability. The study's timeframe, influenced by crises like the COVID-19, may reflect short-term adaptations rather than long-term strategies. Additionally, factors like financial management, marketing, and technology adoption were not deeply explored, leaving gaps in understanding resilience drivers. External influences, such as shifting travel trends and economic downturns, were only partially addressed. Despite these constraints, the study lays a foundation for further research integrating internal business strategies and external environmental factors.

Future research should assess Bali's post-pandemic recovery, comparing locally owned and chain hotels to evaluate cultural integration's role in survival. Examining digital transformation, financial strategies, and workforce resilience—such as employee retention and local hiring—would provide deeper

insights. Studies on regenerative tourism and environmental practices could also highlight sustainable resilience strategies, ensuring long-term adaptability in Bali's tourism industry.

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Appendix 1

Expert Panelists

No	Initials	Position / Institution / Experience	Experience in Accommodation Business
1	TS	Chairman of hotel association, former Vice Governor of Bali, hotel owner, and academia	42 years
2	WS	Tourism practitioners, academia, hotel auditor, former General Manager of international and national chain hotel	30 years
3	HA	Tourism practitioners, former President Director and General Manager of national chain hotel	30 years
4	WS	E-Commerce and Data Analyst Manager of national chain hotel (3 star)	20 years
5	AP	Front Office Manager of family-owned hotel (4 star)	30 years
6	MS	Front Office Manager of family-owned hotel (Non-star)	22 years

Appendix 2

Accommodation Business Classification

Business Activity Type	Classification Code (KBLI) and Description
Star Hotel	55111 Five Star Hotel
	55112 Four Star Hotel
	55113 Three Star Hotel
	55114 Two Star Hotel
	55115 One Star Hotel
Non-Star Hotels	55120 Non-Star Hotel
Other Accommodation Service Providers	55191 Youth Hostel
	55130 Home Stay
	55194 Villa
	55195 Hotel Apartment
	55192 Campground
	55193 Caravan
	55199 Provision of other short-term accommodation

Source: BPS-Statistics Indonesia (Guidelines for Enumeration and Examination of the Accommodation Service Business Survey (VHTL), 2022)

Authors’ Profiles

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