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## Article

# US wine industry preparedness for unforeseen crises and disasters: An empirical test

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Original Research Article

## US Wine Industry Preparedness For Unforeseen Crises And Disasters: An Empirical Test

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**Abstract.** Natural disasters and human-created crises have thrust the topic of strategic preparedness into management conversation around the world. Following recent fire, flood and earthquake disasters, this paper assessed perceived organizational preparedness and resilience as related to four key characteristics: the size of the firm through annual case production and number of employees, the age of the firm, and the organizational hierarchy. Data were gathered via an online survey, where 81 representatives of the western US wine industry responded. Data are analyzed using descriptive statistics, factor analysis, and analysis of variance. Results of this research indicate that wine firms with larger annual case production perceive greater resilience to disaster and crisis than firms with smaller annual case production perceive. Wine firms with more employees perceive greater resilience to disaster and crisis than firms with fewer employees perceive. Significant differences were found among managerial level perceptions of preparedness, in contrast to earlier studies. This study, which is based on exploratory empirical research and leads to a conceptual framework, can shed at least some light on what motivates wine firms to engage in strategic preparedness activities, as well as deepen our understanding of how communities would benefit from those actions.

**Keywords:** black swan events, organizational resilience, strategic preparedness.

### 1. INTRODUCTION

Growing interest in the strategic preparedness of organizations (van der Vegt et al., 2015) has led to extensive study of this subject among scholars. Given its social and economic impacts, many scholars have investigated the drivers/antecedents of strategic preparedness (e.g. Larson and Fowler, 2009; Haimes, 2012; Rao and Greve, 2018; Wang and Wu, 2018; Williams et al., 2017). Despite increasing research, strategic preparedness in the agricultural industry, the wine industry in particular, remains underexamined. Areas of insufficient wine busi-

ness research include how managerial and institutional factors influence strategic preparedness.

The aim of this study is to examine the impact of managerial and institutional factors influence motivations to prepare for and bounce back from the unexpected crisis or disaster. Previous studies have taken an isolated approach to the examination of managerial and institutional factors, treating them separately, and failing to address their combinative effects.

How strategic preparedness for weather-related and other natural disasters, as well as human-created crises) fits into the equation has been thrust into the conversation. Strategic preparedness not only can mitigate the impact of adverse weather and other natural disasters on organizations, but also enable them to sustain or at least quickly resume production or services in order to sustain the economic vitality of the communities in which these organizations operate.

In the past decade alone, catastrophic events have become too numerous (and too frequent) to document. These include earthquakes in California, Indonesia, Japan, and New Zealand; hail and frost losses in Burgundy and Piedmont; hurricanes and flooding in the southern US and Puerto Rico; devastating wildfires in the western US and the Iberian Peninsula; drought in the Western Cape of Africa; data breaches at major corporations and government agencies around the globe; and numerous mass shootings at US and European public places such as tourist attractions, businesses, schools, churches, military installations, and entertainment events, to name just a few.

Strategic preparedness denotes proactive management processes to cope with crises (Augustine, 1995; O'Rourke, 1997; Schroder, 1989). Gruman, Chhinzer, and Smith (2011) found that the providers in the Canadian hospitality industry perceived low levels of disaster preparedness overall. Absent said processes, a firm or an entire industry sector may struggle to maintain its legitimacy (Massey, 2001). When firms or industries cease to operate, even temporarily, organizations, along with the community in which they operate, may be in peril (Kahneman, 2011; Rao & Greve, 2018).

### 1.1 Recent threats to the global wine industry

Fire and earthquake disasters in California, New Zealand, and Northern Spain resulted in damage greater than an estimated \$5 billion to the global wine industry and their surrounding communities from 2014 to 2017. See Table 1 for a partial list of recent natural disasters from 2014 to 2017, and their attendant economic impact on several wine regions.

**Table 1.** Economic Impact of Natural Disasters on Wine Regions, 2014-2017.

| Event      | Region                                | Date    | Economic impact  |
|------------|---------------------------------------|---------|------------------|
| Earthquake | Napa Valley                           | 8/2014  | >US\$500 million |
| Earthquake | Kaikoura (South Isl.),<br>New Zealand | 11/2016 | >NZ\$500 million |
| Fire       | Napa Valley & Sonoma                  | 10/2017 | >US\$9 billion   |
| Fire       | Portugal & Northern<br>Spain          | 10/2017 | >€1 billion      |

Sources: Compiled by authors from Bridges, S., 2017; Kasler, D., 2018; and Macau News Agency. 2018.

Given the monumental impact of natural disasters have imposed on businesses (see Table 1), this paper aims to empirically inquire the effect of certain attributes of wine businesses on their disaster preparedness and resilience strategy. We use a survey methodology to establish an empirical relationship between three primary attributes of a business and its preparedness policy from the perspective of a survey respondent. More specifically, we explore the impact of a firm's size (defined by production and number of full-time employees), its age and the role of the survey respondent in a given wine firm across various perception-based preparedness and resilience measures.

For the rest of the paper, we proceed in the following manner. The next section presents a brief review of previous literature on strategic preparedness in organizations. Section three elaborates upon the exact research questions and our hypotheses based on previous research work. Section four elaborates upon the survey instrument used, the data collection process, the survey response rate and the definition of constructed variables. Section five discusses the empirical findings and the final section offers conclusions, guidance for practitioners, the limitations of this investigation, and suggestions for future research.

## 2. LITERATURE REVIEW

Prior researchers have investigated how managers perceive and prepare for mitigating the impact of exogenous shocks, e.g. on large and on small-to-medium sized firms alike. Swaminathan (1995) examines whether or not wine businesses that were founded during shocks have longer lives than firms founded under more munificent conditions. Rao and Greve (2018) report the effect of an exogenous shock — a flu epidemic — on small, entrepreneurial start-ups in Norway, and opine that researchers also ought to look at

whether such shocks impact the mortality rates of such organizations. Duquesnois et al. (2010) compare the market responses of two long-established producers in the Languedoc-Rousillion region in response to declining market demand. Abel and Bressan (2015) categorize adaptation and resilience strategies from a sample of 273 micro- and small Italian wine firms, all facing systemic crises such as globalization, increasing competition, and declining domestic demand. Wang and Wu (2018) explore motivations in crisis planning and implementation of hotel managers in China and Australia. However, none of these studies deal directly with asymmetric, exogenous shocks.

The literature review is divided into three primary sections: definitions, managerial perceptions, and organizational preparedness. Table 2 provides a compilation of pertinent research in the strategic preparedness arena.

### 2.1 Definitions of threats to an organization's well-being

Strategic preparedness for unpredictable crises and disasters, which seem rare but appear predictable in hindsight, are known as “black swan” events. These events have become a crucial topic in our global society today, and there are numerous opportunities for empirical research in this domain (Taleb, 2007). Firms across numerous industries need to develop proactive enterprise-wide crisis plans in order to mitigate the prospective and possibly uninsurable damage from disasters (Lankoski, 2016; Marra, 1998; Penrose, 2000; Shrivastava, 1987).

Fear of negative events, such as an economic downturn or increasing network competition in a mature industry, however, also induces or paralyzes a firm to enhance its strategic preparedness for consequential changes in its task environment (Abel & Bressan, 2015; Duquesnois et al., 2010; Weber et al., 2015).

### 2.2 Managerial perceptions

Penrose (2000) and Marchall et al. (2010) opine that expectations for proactively addressing social concerns are rising from employees, trade associations, retail groups and customers. Furthermore, according to Marchall et al. (2010), the normative expectations formed by employees and trade associations appear to be felt most significantly by managers. Fowler et al. (2007) suggest that managers' perceptions of strategic preparedness are contingent upon organizational characteristics as well as an employee's status within a firm. Yet many CEOs and senior-level management teams worry that, as their com-

**Table 2.** Prior Research into Strategic Preparedness.

| Strategic preparedness topic   | Author(s)   |
|--|---|
| Definitions of threats to an organization's well-being   |   |
| 1. Low-probability, high consequence events that could threaten the sustainability of the firm   | Shrivastava (1987)                                    |
| 2. Characteristically ambiguous events in terms of cause, effect, and resolution   | Pearson & Clair (1998)                                |
| 3. “Black swan” events: highly improbable but might nonetheless happen”  | Taleb (2007)  |
| 4. Exogenous events that threaten an individual firm or cluster of firms' competitiveness  | Duquesnois et al. (2010); Abel & Bressan (2015)       |
| Managerial perceptions   |   |
| 1. Crisis planning: clear benefit or environmental value   | Penrose (2000); Marchall et al. (2010)                |
| 2. Mitigation of risk or confirmation of fear response behavior  | Bourgeois & Eisenhardt (1988); Leonard-Barton (1992)  |
| 3. Effects of crisis response strategies on firm legitimacy  | Massey (2001)   |
| 4. Perceived likelihood of different crises: natural disasters were perceived most likely to occur while terrorist attacks were perceived as the least likely to occur | Larson & Fowler (2009)                                |
| Planning and preparation for responses   |   |
| 1. Process models for crisis preparedness  | Greening & Johnson (1997); O'Rourke (1997)            |
| 2. Crisis communication planning   | Marra (1998); Ullmer (2001)                           |
| 3. How firm size, age, managerial level, and other variables impact preparedness planning  | Fowler, et al. (2007); Lankoski (2016); Haimes (2017) |

Source: prepared by authors for use in this investigation.

panies improve strategic preparedness for social sustainability, their competitiveness deteriorates (Nidomolu et al. (2009). Still, companies that are proactive in preparing for unanticipated events are more likely to rethink their business models, products, technologies and processes. In doing so, these companies may foster innovations that lead to renewed and sustainable competitive advantage (Nidomolu et al., 2009).

Haimes (2012) defines strategic preparedness as “a proactive phase of risk management...for emergent forced changes, whether originating from natural or human sources” (pg. 1842). Fowler et al. (2007) suggest that differences in perception of disaster and crisis preparedness may be contingent upon an individual's level of standing within the firm, i.e., top-level managers and owners claim to have a higher level of perceived preparedness than their employees claim. People are the most important assets for businesses. A critical source of

capacity for organizational resilience is contained in the characteristics of employees (Lengnick-Hall et al., 2011; Luthans et al., 2007).

### 2.3 Planning and preparation for responses

Firms that properly plan and prepare for environmental and social challenges are more resilient (Ortiz-de-Mandojana, 2012). Evaluating prior research on the topic of resilience of businesses to crises and disasters, Linnenluecke (2013) opines that: (1) research on organizational resilience is highly fragmented with sparse conceptual development; (2) resilience has been studied mostly through case examples in a wide variety of contexts and settings, yet findings are often not integrated; (3) existing attempts to detect resilience (or absence thereof) have employed retrospective analyses after an adverse impact has occurred, but provide little insights into predictive factors leading to future resilience.

Despite numerous theoretical investigations into crisis management and disaster preparedness, there is scant prior research on proactive activities such as institutionalized processes, executives' and employees' perceptions of risk, and adoptions of firms' crisis management preparations, considered as part and parcel of pre-event preparedness (Pearson & Clair, 1998). Greening and Johnson (1997) indicate that there are some basic criteria for ranking the relative merits of a firm's options to respond to crises and disasters. These criteria may include: (1) Cost: can the company afford to respond? (2) Corporate public relations: can the company make a prompt, full disclosure, assume responsibility, express concern and make efforts to correct mistakes in the long run; and (3) Corporate values: are they expressly oriented towards Corporate Social Responsibility (CSR), i.e. is there a track record of acknowledging responsibility and maintaining existing commitments to stakeholders' well-being? (cf. Greening & Johnson, 1997). Haimes (2012) identifies a model to explain the relationships among vulnerability, resilience, risk, the states of a system, and the specific emergent forced changes. In sum, resilience may be defined as the ability of a firm to anticipate trends and potential threats, to cope effectively with unexpected events and to learn from these events to foster dynamic capabilities to facilitate change (Weick & Sutcliffe, 2007; Duchek, 2014).

Taken together, crisis management and resilience are manifestations of the pre-event preparedness for the challenge of adversity, in that resilience is viewed as an interaction between the organization and the environment and comprises pre-adversity capabilities, in-crisis organizing and adjusting, and post-crisis resilience responding (Williams et al., 2017). Further investiga-

tions are clearly needed to uncover institutionalized processes for coping with unexpected events (Ullmer, 2001); managers' perceptions of risk (Bourgeois & Eisenhardt 1988; Leonard-Barton, 1992); and adoptions of organizational crisis management preparations (Pearson & Mitroff, 1993; Pearson & Clair, 1998).

## 3. RESEARCH QUESTIONS AND HYPOTHESES

A firm's age and size are important variables that are said to lend themselves to liabilities of smallness and newness (Stinchcombe, 1965). Managerial perceptions and strategic preparedness of firms in different kinds of industries have also been shown to wield considerable influence over firm performance in prior studies. Arend (2014) opines that,

*The firm characteristics of newness and smallness...also provide a solid basis for building upon in future work because they proxy for more sophisticated factors such as: scale economies, market power, bargaining power, resource slack, specialization, experience, and so on.* (Arend, 2014, p. 36, f 2)

Our research questions are organized around firm size, firm age, and level of managerial hierarchy or role.

### 3.1 Firm size

Firm size can be advantageous for implementing planned change (Ford, 2009). Newer and smaller firms have lower survival rates in the absence of growth (Freeman et al., 1983; Steffens et al., 2009), while survival rates increase as firm size and age increases (Gilbert et al., 2006). Firm size also appears to explain the variance in strategic preparedness in response to environmental threats (Smith et al., 1989). A larger firm will possess greater resources and potentially more market knowledge to identify and implement strategic responses that are not available to smaller firms to mitigate adverse environmental changes. Smaller organizations may be limited in terms of available resources, including human and social capital (Lumpkin, et al., 2010). Large firms also show a higher propensity to innovate than smaller firms, while a firm's innovation practices do not depend upon its age (Duchek, 2014; Moohamad et al., 2014). Case production and number of employees are acceptable proxies for estimating the size of a wine business (Delacroix & Swaminathan, 1991). This leads to our first research question.

**RQ<sub>1</sub>** – Are larger wine businesses better prepared for “black swan” events than smaller wine businesses?

To investigate this research question, Fowler et al.'s (2007) propositions regarding organizational character-

istics related to disaster preparedness are modified and applied. See hypotheses 1 and 2 below.

**H<sub>1</sub>** – Larger firms will exhibit a higher proactivity towards strategic preparedness than smaller firms (firm size determined by annual production).

**H<sub>2</sub>** – Firms with more employees will exhibit a higher proactivity towards strategic preparedness than firms with fewer employees.

### 3.2 Firm age

Firm age has been posited to be a significant determinant of an organization’s ability to conduct environmental scanning activities (Mengistae, 1996; Mohan-Neill, 1995; Thomas & Ramaswamy, 1996; Yasuda, 2005). The age (in years since founding) of a firm can be associated to its strategy (Grinyer & Yasai-Ardekani, 1981). Newer entrants in the wine industry tend to pursue an “aggressive” strategy aimed at niche market definition and penetration via “entrepreneurial” behaviors (Brown & Butler, 1995). Established, growing businesses in an industry, by contrast, tend to experience diminishing efficacy of entrepreneurial behavior and need to pay greater attention to building management systems and market share (Jordan et al., 2007; Mora, 2006).

Whereas long-established firms tend to be strategic in implementing planned change (Ford, 2009), the size of an organization, measured by researchers using assets accumulated, production capacity, and/or employees as proxy variables, can explain the variance in strategy and performance (Smith et al., 1989), or its movement toward or away from diversification (Grinyer & Yasai-Ardekani, 1981). A newer, more entrepreneurial organization might also have a different view of its environment in terms of its views for success (Lumpkin et al., 2010). An organization’s longevity can negatively impact knowledge acquisition and entrepreneurial growth (Naldi & Davidson, 2014). This leads to our second research question.

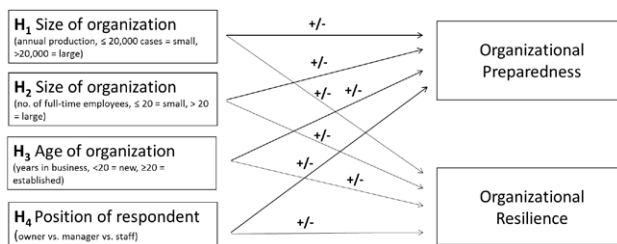
**RQ<sub>2</sub>** – Are established wine businesses better prepared for “black swan” events than newer wine businesses?

How organizational age is related to disaster preparedness is conceptualized in hypothesis 3 below.

**H<sub>3</sub>** – Older firms will exhibit a higher proactivity towards strategic preparedness than younger firms.

### 3.3 Level of responsibility within the firm

Prior literature on organizational preparedness for an unexpected disaster or crisis has tended to focus



**Figure 1.** Proposed Variables Impacting Preparedness and Resilience. Source: prepared by authors for use in this investigation.

solely on top management responses (McLean & Power, 2014, Trainor & Velotti, 2013). Identification of the performance effects of the manager-strategy orientation mirrors prior research into those managerial characteristics said to be associated with organizational success (Child, 1974; Norburn & Birley, 1988; Sambharya, 1989; Thomas & Ramaswamy, 1996). Among these investigations, Sambharya (1989) notes that firms led by CEOs with longer tenures tend, on average, to outperform other firms. Our third research question seeks to broaden understanding of preparedness at both level of responsibility and organization-wide.

**RQ<sub>3</sub>** – Are owners and top-level managers of wine businesses better prepared than lower-level staff for “black swan” events?

Again, Fowler et al.’s (2007) proposition regarding managerial hierarchical impacts on perceptions of preparedness is adapted for hypothesis 4.

**H<sub>4</sub>** – Upper-level managers and owners will perceive better strategic preparedness than lower-level employees.

Figure 1 represents the proposed variables that impact preparedness and resilience. The independent variables (IV) to be tested are organization size, organization age, and managerial hierarchy against perceptions of strategic preparedness and resilience, the dependent variables (DV). While the focus of Fowler et al.’s (2007) study was to test crises preparedness, we have attempted to extend its framework and investigate both preparedness and resilience.

## 4. METHODOLOGY

### 4.1 Survey instrument

We adapted Fowler et al.’s (2007) questionnaire using the same end choice points (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree) for the questions; however, we added one question, “My organiza-

tion has provided every employee with access to a text message or other digital notification system in the event of an emergency,” in order to reflect changes in communications technology in the decade or so since Fowler et al.’s earlier study. We found Fowler et al.’s original 21-item scale to have a reliability ( $\alpha = .815$ ); whereas the 22-item scale with the added question to have a reliability ( $\alpha = .819$ ).

From May – June 2018, a pilot survey via Qualtrics Survey Software was sent to 400 Northern California university wine business program alumni (undergraduate, MBA, and EMBA), resulting in a response rate of 12.5 percent. The resulting sample was too small for meaningful analyses; therefore, excluded from the study. Follow-up qualitative interviews to verify, refute, or amplify quantitative responses and clarify the understanding of questions were conducted with eight individuals representing four different wineries during August-September 2018.

As there appeared to be little or no confusion about the 22 questions from the pilot study and interviews, the same survey via Qualtrics Survey Software was sent to a larger sample of 3,775 winery executives in the *Wines & Vines* database during a one-month period from October-November 2018. The intent of obtaining a larger sample was to permit higher-level statistical analyses to provide a more balanced viewpoint not easily obtainable from the exploratory cross-sectional pilot survey data (Patton, 2002). Of the 3,775 email addresses in the database, 3,425 turned out to be valid. After three mailings as per Dillman (1991), 108 responses were received, but only 81 responses were sufficiently complete for further analyses. Probable causes of such high non-response include an over-surveyed industry, sensitivity over the 2017 Sonoma/Napa fires, concern over the concurrent November 2018 Camp Fires in Northern California, or respondents’ general lack of interest in participating in surveys. As to a comparison of those who didn’t complete the survey to those who completed the survey, sufficient demographic information to analyze for non-response bias via Chi-square tests found no significant differences.

Because of the sensitivity of the questions, the topical event, the criticality to time (lapse to the event), and memory details, we chose to move forward with the small sample in line with other small sample research (Köhr, Malorgio & Aragrande, 2017; Williamson et al., 2012).

#### 4.2 Demographics

Demographic information was obtained from self-report. Of the 81 respondents, forty-five percent ( $n=37$ )

were winery executives (Owner/CEO/President), while the respondents had been employed an average of 14.3 years. Fifty-nine percent ( $n=48$ ) of the wineries were considered established, having been in business 20 years or more. Wineries, of which 60 percent were located in Northern California, had been in business an average of 28½ years and had an average of 38 full-time employees. Forty-eight percent ( $n=39$ ) of the wineries were considered large where its annual production was greater than 20,000 cases of wine.

#### 4.3 Analyses

The IV to be tested were organization size, organization age, and managerial hierarchy. Organization size was defined two ways: annual production in cases and the number of full-time employees. Dichotomous variables were created for annual production in cases, where small was  $\leq 20,000$ , and large was  $> 20,000$ ; and for number of full-time employees of the firm, where small was  $\leq 20$ , and large was  $> 20$ . A dichotomous IV was created for organization age, where new or young had  $< 20$  years in operation, while established organizations had  $\geq 20$  years in operation. The respondent’s level of responsibility defined the IV managerial hierarchy using three levels - executive (Owner/CEO/President), management, or staff.

SPSS Statistics, Version 26 was used to analyze the data. Content review of the literature and study questions resulted in our conducting an informal confirmatory factor analysis using the principal components’ extraction method and varimax rotation method, permitting evaluation of the correspondence between the measurement items in the survey while extracting two factors theorized from Fowler et al.’s (2007) questionnaire: organizational preparedness and organizational resilience. The first factor (organizational resilience) had an eigenvalue of 4.95 and the second factor (organizational preparedness) had an eigenvalue of 2.22, where greater than 1 is considered significant; and both accounted for 34.13% of the total variance explained. While the total variance explained was low, the sample observations per variable to be analyzed minimum was met for conducting factor analysis, and thus it was deemed satisfactory to move forward (Hair et al., 1998). Results of the initial analysis with factor loadings with corresponding item questions are presented in the Table 3. One question from Fowler et al.’s original 21 questions (“It would be easy for a potentially threatening nonemployee to gain access to my workplace”) was reverse-coded and omitted after initial factor analysis and reliability analyses revealed insufficient loadings and unsatisfactory

**Table 3.** Factor Analysis Loading with Question Items.

| Question Item  | Factor R    | Factor P    |
|--|-------------|-------------|
| I am very familiar with our workplace evacuation plan.   | .075        | <b>.692</b> |
| If my organization suffered a serious crisis or disaster, I might be in danger of losing my job. [Reverse-coded]   | -.075       | <b>.450</b> |
| If my organization suffered a serious crisis or disaster, I would still be paid until we could reopen.   | <b>.570</b> | -.002       |
| If my organization suffered a serious crisis or disaster, I would still have my job.   | <b>.484</b> | .160        |
| If my organization suffered a serious crisis or disaster, I would still be covered by my organization's employee benefits (e.g. health insurance).   | <b>.490</b> | .053        |
| My organization has provided every employee with access to a text message or other digital notification system in the event of an emergency.   | .208        | <b>.412</b> |
| My organization has provided every employee with a crisis or disaster preparedness kit (e.g. smoke mask, flashlight, etc.).  | <b>.617</b> | .053        |
| The security at my workplace is adequate.  | .122        | <b>.514</b> |
| In the event that my organization suffered a serious crisis or disaster, I am familiar with the plan for how family members can receive notification on the status and safety of their relatives.  | .262        | <b>.609</b> |
| In the event that my organization suffered a serious crisis or disaster, I am familiar with my organization's plan to continue its operations at another location.   | <b>.629</b> | .086        |
| All organization members are required to rehearse portions of our emergency preparedness plan, e.g. evacuation.  | <b>.575</b> | .161        |
| Security at my workplace has significantly increased since the most recent crisis or disaster.   | <b>.501</b> | .118        |
| I know where the nearest fire extinguisher is located near my desk or workstation.   | .044        | <b>.669</b> |
| If a serious crisis or disaster were to occur at my organization, I am familiar with our plan on how to communicate with my fellow employees at scattered or remote locations (such as mobile phone numbers, websites, or e-mail lists). | .336        | <b>.627</b> |
| Most of our organization's employees are familiar with our crisis and disaster preparedness plan.  | .220        | <b>.681</b> |
| As part of our emergency preparedness plan, customers and suppliers would know how and still be able to contact our organization for information.  | <b>.423</b> | .378        |
| If a serious crisis or disaster were to occur at my organization, I would still have access to the data that I need to do my job (e.g. backed up at a remote site).  | <b>.373</b> | .279        |
| My organization offers to pay volunteer employees to be trained in basic life support techniques (e.g. CPR, first aid).  | <b>.570</b> | -.019       |
| My organization has a contingency plan in place so that our customers would be covered if we were to suffer a disaster.  | <b>.651</b> | .083        |
| I know where the nearest emergency exits are to my desk/workstation.   | -.105       | <b>.542</b> |
| My organization's emergency preparedness plan has been coordinated with local agencies, such as the fire and police departments.   | <b>.483</b> | .100        |

reliability. The reliability, again using Cronbach's (1951) alpha of the Factor R – organizational resilience items was 0.780 and the Factor P – organizational preparedness items was 0.765.

## 5. RESULTS AND DISCUSSION

Hypothesis testing was accomplished using analysis of variance (ANOVA). Following Fowler et al.'s (2007) study, we calculated the sum from each respondent's scores for each variable, thus the higher scores suggested the higher perception of organizational preparedness and organizational resilience. Results of the hypothesis tests are shown in Table 4.

Hypothesis 1 proposed that firms with higher annual wine production would exhibit a higher proactivity towards organizational preparedness than firms

with small annual case production. Hypothesis 1 was not supported for the DV – Preparedness, but was supported for DV – Resilience, with the F score of 4.553 and significance level of .036 using an alpha cut-off of .05. Although respondents from firms with larger annual case production reportedly did not feel more prepared for black swan events than those from smaller firms, the larger producers perceived themselves to be significantly more resilient in the face of change than smaller producers, which is consistent with earlier findings from Maurel (2009).

Hypothesis 2 proposed that firms with more employees would exhibit a higher proactivity towards organizational preparedness than firms with fewer employees. Similar to Fowler et al.'s (2007) findings, Hypothesis 2 was not supported for DV – Preparedness, but was supported for DV – Resilience, with the F score of 6.916 and significance level of .010 using alpha cut-off



**Table 4.** Analysis of Variance Results.

| H  | IV              | N      |        |      | Variable Means | DV       | F            | Sig          |        |        |
|----|-----------------|--------|--------|------|----------------|----------|--------------|--------------|--------|--------|
| H1 | Firm Size-Prod# | Sm-41  | Lg-39  |      | Sm-20.1        | Lg-19.8  | Preparedness | 0.092        | .762   |        |
|    |                 | Sm-41  | Lg-39  |      | Sm-28.2        | Lg-30.8  | Resilience   | 4.553        | .036*  |        |
| H2 | Firm Size-Empl# | Sm-45  | Lg-34  |      | Sm-20.1        | Lg-20.0  | Preparedness | 0.014        | .905   |        |
|    |                 | Sm-45  | Lg-34  |      | Sm-28.2        | Lg-31.4  | Resilience   | 6.916        | .010** |        |
| H3 | Firm Age        | Yng-33 | Est-48 |      | Yng-20.0       | Est-19.9 | Preparedness | 0.005        | .944   |        |
|    |                 | Yng-33 | Est-48 |      | Yng-29.3       | Est-29.6 | Resilience   | 0.077        | .782   |        |
| H4 | Employee Level  | S-10   | M-33   | O-37 | S-20.5         | M-18.5   | O-21.1       | Preparedness | 5.843  | .004** |
|    |                 | S-10   | M-33   | O-37 | S-32.4         | M-29.1   | O-29.1       | Resilience   | 1.555  | .218   |

Significance at \* $p < .05$ , \*\* $p < .01$ .

of .05. While respondents from firms with larger numbers of employees did not feel more prepared than smaller firms for black swan events, those same firms did feel significantly more resilient, that they could get back to business quickly, consistent with Gil and Mataveli (2017).

Hypothesis 3 proposed that older firms would exhibit a higher proactivity towards organizational preparedness than younger firms would. This hypothesis was not supported for both DV – Preparedness and Resilience. Respondents from the more established firms did not perceive preparedness for a black swan event, nor did they perceive greater resilience to overcome a black swan event over the smaller firms, confirming Galbreath et al. (2016).

While Fowler et al. (2007) found top and middle level managers perceived a higher level of preparedness compared to employees, this study also found significant differences between the three employee levels (executive (Owner/CEO/President), management, and staff). Hypothesis 4 was supported for DV – Preparedness with the F score of 5.843 and significance level of .004 using alpha cut-off of .01, but was not supported for DV – Resilience. Significant differences in perceptions of preparedness were found between responding executives and management (sig. = .005; mean difference 2.539 at .05 level) in the Scheffe ) *post hoc* tests, as well as staff employees and management (sig. = .085; mean difference 1.985 at .10 level) in Fisher's Least Significant Difference (LSD) *post hoc* tests. Those respondents who described themselves as executives and staff employees reported feeling much more prepared than responding managers. These findings reflect those of an earlier investigation into wine firms' environmental preparedness (Cordano et al., 2010).

## 6. CONCLUSIONS

Environmental disasters and human-created crises have increased the complexity, disruption and interconnectedness of a broad range of threats and hazards to which firms are expected to respond (van der Vegt et al., 2015). Effective responses and recovery processes are crucial in addressing the aftermath and saving lives and livelihoods. Proactive investment in prevention and mitigation have become necessities to reduce the short- and long-term negative social and economic impacts (van der Vegt et al., 2015). A large percentage (86%) of respondents felt confident that if a disaster struck, employees at the company could carry out the disaster preparedness plan, which is in line with Gruman (2018) at 75% of respondents.

Based on our exploratory findings, owners and managers of wine businesses must find the right balance between planning and remaining operational. No matter how well a plan has been thought out, unexpected events – “black swans” – will happen (Taleb, 2007: 203-4). One of the hallmarks of a successful business is adaptability, regardless of what its business plan. For some wine businesses, the environment is too turbulent for extensive planning to be beneficial (Conz et al., 2017). When a crisis occurs, managers may find that there is not enough information to allow them to follow a comprehensive plan. In this case, a manager's ability to adapt may be more important than following a careful plan for the future. Earlier investigations into preparedness in the wine industry have largely been concerned with adaptive responses by firms to climate change (Bernetti et al., 2012; Galbreath et al., 2016; Merloni et al., 2018). Prior researchers have likewise investigated the motivations of senior-level managers and owners that deliber-

ately ignored opportunities to grow their firms, motivations including concern for employee well-being, loss of the positive “small” business atmosphere, less involvement and job satisfaction, and fear of negative events, such as an economic downturn (Wiklund et al., 2003). On the other hand, for incumbent firms in the wine industry, organizational characteristics such as size can drive profitable growth (Sellers & Alampi-Sottini, 2016).

While the organizational preparedness instrument proposed by Fowler et al. (2007) has been adopted in the management literature for over a decade, no study has since attempted to unpack the different constructs included within this instrument. We have explored and proposed organizational preparedness and organizational resilience as two constructs within this instrument, which can further our understanding of organizational preparedness in the wine industry, and extended Fowler et al.’s (2007) study through analyses of two factors: Preparedness and Resilience. Organizational resilience may also possess interactive effects on perceived strategic preparedness. We will assess that interaction in a separate, forthcoming investigation (Bhamra et al., 2011; Kantur & Iseri-Say, 2012).

Preparedness and resilience are generally viewed as desirable characteristics of organizations that are able to contend with various types of unexpected, abrupt and/or ‘extreme’ changes in their environments. However, despite the growing utilization of the concept in the popular press and academic research, there have been few insights into the conceptualization, operationalization and empirical assessment of the resilience factor (Linnenluecke, 2013). Success or failure to innovate in the face of unexpected events has been attributed to the knowledge base of the firm (Leonard-Barton, 1992; Tellis, 2006). To weather those events, wine business owners, executives, and their employees must foster serendipity and resilience to prepare for emergencies, i.e. by adopting new technologies, procedures, or employee-centered services (McCann et al., 2001). That is, not only is the contribution of a proactive, healthy organizational culture to good strategy implementation certainly positive, but also the main benefit of a healthy culture is organizational resilience in the face of setbacks. (Kahne-man, 2011: 263). To make processes work efficiently and effectively, however, managers must have the knowledge of disparate values, cultures, and attitudes when pursuing innovations in different nations or regions (Wilkins & Ouchi, 1983).

In summation, this exploratory study has a number of contributions. First, this study contributes to strategic preparedness literature by suggesting combinative effects of managerial and institutional preparedness. Second,

this study contributes to an understanding of how the characteristics of the organization affect social entrepreneurship by highlighting the moderating roles of firm age and size. Third, our findings corroborate the earlier studies of strategic preparedness initiatives undertaken by organizations, suggesting the need for policy-makers to be aware of these unique characteristics in their efforts to encourage both sectoral and community preparedness. Fourth, our findings found significant differences among managerial level perceptions of preparedness, in contrast to earlier studies.

### 6.1 Implications for practice

Communities in which wine business operate and to which those businesses provide economic benefits nevertheless face the future prospect of more extreme, frequent and damaging natural disasters and possible resilience failures (McKnight & Linnenluecke, 2015). Firms are crucial stakeholders in building the resilience of the communities in which they operate, and play a central role in supporting communities impacted by natural disasters, e.g. by delivering essential products and services during a natural disaster, and supplying inputs crucial for disaster recovery (Ballesteros et al., 2017). Nevertheless, a gap remains to be crossed between the public policy literature that focuses on community-level resilience (Ballesteros et al., 2017; McKnight & Linnenluecke, 2015; Weick, 1977; Weick & Sutcliffe, 2007), and disaster-oriented management research, i.e. that focuses on firm-centric reactions to natural disasters (Larson & Fowler, 2009; Lengnick-Hall et al., 2011).

Businesses must not only operate in conformity with their legal and regulatory environments, but they also require a more tacit ‘license to operate’ from the local community in which they reside. Surprisingly, few studies have investigated corporate social responsibility (CSR) in the wine industry *per se*, and none has examined disaster preparedness and response as a focal topic. Firms in the wine industry typically encounter both support and opposition in the communities where their operations are based, and as wine firms attempt to build out the event-based and tourism sides of their businesses, they may be viewed as generators of economic development (i.e., wealth creation, jobs, and tax revenues), yet concomitantly remain vulnerable to community opposition (McCuan & Hertz, 2018). Earlier investigations examined whether or not a firm’s environmental practices influence wine consumers’ attitudes towards wine firms (Forbes et al., 2009; Nowak et al. 2008) and whether or not philanthropy as a voluntary component of CSR positively impacts external stakeholders, at least

in the short term (Forbes et al., 2018). Managers of firms who engage in CSR resource allocation can create value at times for their shareholders through the creation of insurance-like protection (Godfrey et al., 2009). How would suppliers, customers, communities, regulatory agencies, even insurers, among other external stakeholders, respond to the withdrawal of a wine firm's voluntary support from these capability-building activities? Would external stakeholders allow wineries to continue production and distribution of products, conduct 'cellar door' sales, open their tasting rooms to the public, and host special events?

Marchall et al. (2010) note that expectations for proactively addressing social concerns are rising from employees, trade associations, retail groups and customers. Furthermore, it is the normative expectations formed by employees and trade associations that appear to be felt most significantly by managers. In contrast to traditional risk management approaches taken by firms and their insurers, i.e. that focus on the identification of risks and alleviating the level of vulnerability to external disturbances, adopting a resilience approach to disturbances requires developing capabilities and capacities that create or retain resources and capabilities that are of necessity flexible, storable, convertible, and malleable to permit firms to contend with and learn from the unexpected (Sutcliffe & Vogus, 2003).

Viewed through the lens of the resource-based view of strategy, resources and capabilities for preparedness, particularly in the face of environmental turbulence, is considered to be a potential core competence for the firm (Racherla & Hu, 2009). Ameliorating the preparedness and resilience of firms and creating value for internal stakeholders, including owners, can help mitigate organizational deficiencies, overcome organizational rigidity, and forestall lost opportunities (Barney, 1991; Wernerfelt, 1984). Firms said to be able to develop proactive social and environmental practices (SEP) may use those as a buffer against shocks and return more quickly to their pre-crisis status (Ortiz-de-Mandojana & Bansal, 2016). Over the longer term, firms that invest in SEP may emerge even stronger: they can experience lower financial volatility, have higher rates of survival, and grow faster than rivals that are less responsive to social and environmental issues (Ortiz-de-Mandojana & Bansal, 2016). In practice, good deeds and careful long-term planning appear to enable some firms to 'pay it forward.'

One might well consider an opposing viewpoint, namely, that preparedness should be viewed as detrimental to the sustainability of a wine firm or any other business (Hamel & Valikangas, 2003). For example, pre-

paredness for disruptions of a producer's supply chain may be considered by some to be excess organizational slack, i.e. a sign of inefficiencies. In that view, voluntary actions to contend with crises and disasters, while potentially leading to innovations in supply chain management, could be neutral with respect to or even have adverse impacts on a firm's financial and social performance (Akgün & Keskin, 2014). That there appears to be a trade-off between the costs and benefits in the short term relative to the long term is a central issue for achieving both business and societal sustainability (Ortiz-de-Mandojana & Bansal, 2016).

## 6.2 Limitations and future research

First, any research such as ours that analyzes unverified cross-sectional data that are not verified by secondary or other sources of data can have questionable reliability. Second, while Fowler's (2007) survey instrument has proven validity, we may have missed some important questions specific to the nature of the wine industry in an attempt to keep the survey short and minimize technical terminology in order to increase response rates. Along these lines, due to the fact that the wine industry may be suffering from being over-surveyed, or due to the sensitive nature of some of the questions in our instrument, our sample size was limited. Thus, results obtained may or may not be representative of all US wine businesses, wine regions, or attributes of these businesses.

Despite these limitations, future wine industry research studies should test whether these two constructs can explain greater variance in firm- and employee-level predictors and outcomes across different groups of wine businesses and employee groups in different regions of the US as well as in other countries. Furthermore, research studies in industries other than wine should test whether the validity of our construct factors holds in other industries, as well as the extent to which there are differences between the results of our study and those of studies based on firms in other industries.

Additional work is also needed to quantify the relationship between an employee's sense of trust in the organization, perception of empowerment and cohesive organization culture and perceived preparedness and resilience and identify key indicators of this potentially mitigating force.

Although ours is an inconclusive cross-sectional investigation into preparedness behaviors that has been conducted in the aftermath of natural disaster events in Northern California, strategic choices to engage in long-term strategic preparedness activities within the wine firm to cope with adversity are of great importance to

understanding firm behavior. Future researchers might well consider conducting longitudinal studies of strategic preparedness. We hope that our investigation, which is based on exploratory empirical research and leads to a conceptual framework, can aid future researchers and shed at least some light on what motivates wine firms to engage in strategic preparedness activities, as well as deepen our understanding of how communities would benefit from those actions.

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