

Does social capital pay off? The case of small business resilience after Hurricane Katrina

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Abstract

This article uses objective and subjective measures of small business resilience and multiple categories of social capital pay-offs to answer two main questions. Does social capital pay off after a natural disaster; and if it does, what type of social capital has the greatest impact on small business resilience? The pay-off from bridging social capital—receiving support from the community—is what drives both objective and subjective resilience post-Katrina. The results also show linking capital—support from institutions—can improve economic resilience. Our results provide evidence social capital is a key asset for long-term resilience for small businesses. Business owners with links to the community and institutions—with more social capital—will be better off when facing a natural disaster.

KEYWORDS

Hurricane Katrina, natural disaster, resilience, small business, social capital

1 | INTRODUCTION

Small businesses are prime economic generators (Edmiston, 2007), but they are greatly vulnerable to a variety of risks including natural disasters. As disasters increase in frequency and intensity (Dilley, 2005), many small businesses struggle to survive and those that just survive are at risk of demise (Schrank, Marshall, Hall-Phillips, Wiatt, & Jones, 2013). One explanation is that natural disasters affect small business owners in two ways: as business owners and as local residents (Runyan, 2006; Sauser, Baldwin, Pourreza, Randall, & Nowicki, 2017). Another reason is their lower access to resources may limit resilience, when compared to larger businesses (Sauser et al., 2017). Most of the disaster literature has focused on the financial and physical resources fostering resilience. A recent body of literature has stressed the importance of community-based networks can promptly help small businesses adapt and respond to disasters (Aldrich, 2012). This article contributes to the literature by investigating small business resilience through the lens of social capital.

Resilient businesses are those that not only remain operating but also thrive after a disaster (Chang, 2010). Postdisaster business resilience is the product of many complex decisions resulting from the interaction of individuals, families, businesses, and communities (Marshall & Schrank, 2014). The terms resilience, recovery, and

survival have been used ambiguously and interchangeably in the literature. Most researchers use survived, recovered, and resilient to define a business still in operation after the disaster, regardless of the financial or attitudinal status of the business. For example, an open business is considered recovered or resilient even though that business may be worse off than before the disaster. This study uses the Small Business Disaster Recovery Framework (SBD RF) by Marshall and Schrank (2014) to provide a universal and precise definition of small business resilience. The SBD RF framework categorizes operating businesses as survived, recovered, or resilient among operating businesses. The framework and a primary collected data set allowed us to identify the impact of social capital on small business resilience.

Where objective measures of resilience are fundamentally at the heart of resilience, their weaknesses (definitions of economic-financial resilience and compatibility of financial indicators, for example) are familiar. With few exceptions, capturing subjective measures and processes that contribute to small business resilience postdisaster are difficult to quantify. However, subjective measures of business resilience may mimic personal resilience and worth the effort. Tugade and Fredrickson (2004) provide an example citing metallurgical resilience: *Cast iron is hard, brittle, and breaks easily (not resilient),*

whereas wrought iron is soft, malleable, and bends without breaking (*resilient*), suggesting that the metaphor be carried over to individual psychological resilience (p. 320). We enhance the small business disaster literature by providing both objective (economic success) and subjective (attitudinal success) measures of small business resilience. Resilience has been predicted by subjective measures, as in the case of mindfulness (Nezlek, Holas, Rusanowska, & Krejtz, 2016), but never before in the disaster resilience literature. This approach permits an expanded and holistic examination of small business long-term sustainability. By doing so, we offer possible interpretations for small business resilience that are difficult to explain by only objective interpretations.

Aldrich (2012) illustrates how social capital—the networks that formally or informally offer resources—explains the ability to withstand a disaster and recover. There is little focus in the disaster literature on how the pay-offs received from these linkages formed by individuals, community, and institutions drive small business resilience after a natural disaster. Where most studies have implied being part of a network provides social capital resources, this article provides empirical evidence of the pay-off from social capital by incorporating Aldrich categories of social capital: bonding (support received from similar individuals such as family and friends), bridging (support received from community organizations), and linking (support received from institutions). Using primary data, we advance the literature by investigating what effect the pay-off from social capital has on small business economic and attitudinal resilience after a natural disaster.

We contribute to the literature in two ways. First, this article bridges the existing gap between the social capital and postdisaster small business resilience literature. We answered two main questions. Does social capital pay off after a natural disaster? If so, what type of social capital has the greatest impact on small business resilience? These questions shed light on the relevance of social networks in the postdisaster recovery process. Second, the article provides empirical evidence of how the linkages of business owners with family, community leaders, and institutions helped businesses not only remained operating but also thriving after Hurricane Katrina.

2 | THEORETICAL FRAMEWORK

Resilience takes place over time and is related to the recovery of individuals, businesses, communities, and institutions (Chang, 2010). Most studies consider postdisaster business resilience as a binary stage of open or closed businesses at a certain point in time (Marshall & Schrank, 2014). The current small business disaster literature has not acknowledged resilience is a status within the recovery process (Marshall & Schrank, 2014). For instance, a business can remain operating immediately after a disaster but may close a few weeks after they reopen. In the same way, assuming an open firm is resilient may ignore that some businesses are hardly surviving and may be facing constant risk of demise. The SBDRF acknowledges that (a) recovery is a process that takes place over time, and (b) operating status does not equal resilience (Brown et al., 2008; Marshall & Schrank, 2014).

Figure 1 illustrates the SBDRF as the proposed guide to study small business resilience under a continuum time frame (e.g. pre-event and postevent). The SBDRF incorporates time intervals and compares the predisaster baseline to postdisaster status. The model provides a basis for the terminology used for business resilience in this study. Operating small businesses are categorized as survived, recovered, and resilient based on the comparison of pre- and post-disaster status. First, a survived business is one that has not reached pre-event levels. Second, a recovered business has returned to the predisaster status. At last, a resilient business has exceeded the baseline performance at the time of the survey.

Small businesses are survived, recovered, and resilient, based on the change in pre- and postdisaster gross revenues. Following the SBDRF recovery process, firms must survive to recover and recover to be resilient. Thus, this study assumes postdisaster recovery is an ordered process. The present research considers the drivers of survival, recovery, and resilience may not be necessarily the same. In other words, survival, recovery, and resilience are different, but ordered, stages of building resilient small businesses.

This study draws from the sustainable family business theory (SBFT) enhanced by Danes, Lee, Stafford, and Heck (2008). The authors base the SBFT on the systems theory, which values the intersection of business, family, and community to explain small business decision-making. The SBFT's central tenets stipulate that a business is composed of business owners that rationally optimize objectives within the business–family–community interface. The SBFT is used to enhance the disaster literature by including business owners' perceptions of success as a measure of successful family–business interface. Owner's perceptions are ordered as less successful, equally successful, and more successful than before Hurricane Katrina. Together economic success and attitudinal success indicate long-term business resilience.

3 | LITERATURE REVIEW

3.1 | Hurricane Katrina

Hurricane Katrina hit the coasts of Mississippi and Louisiana in August of 2005. Hurricane Katrina was one of the costliest and most destructive hurricane to strike the United States (Deryugina, Kawano, & Levitt, 2014). The Federal Emergency Management Agency (2016) estimated the total damage of Hurricane Katrina to be about \$151 billion. While the repercussions of Hurricane Katrina still cast a long shadow over Mississippi, only a few studies documented the impacts on small businesses and fewer considered social capital as a key factor for small business resilience.

Using a geographic information systems (GIS), Jarmin and Miranda (2009) estimated that the impact of Hurricane Katrina sharply reduced business growth and number of payrolls relative to previous business performance and to businesses located in communities that were not affected by Katrina. In their study, businesses that suffered the greatest economic impact closed operations immediately following Katrina. While Deryugina et al. (2014) found that federal aid and

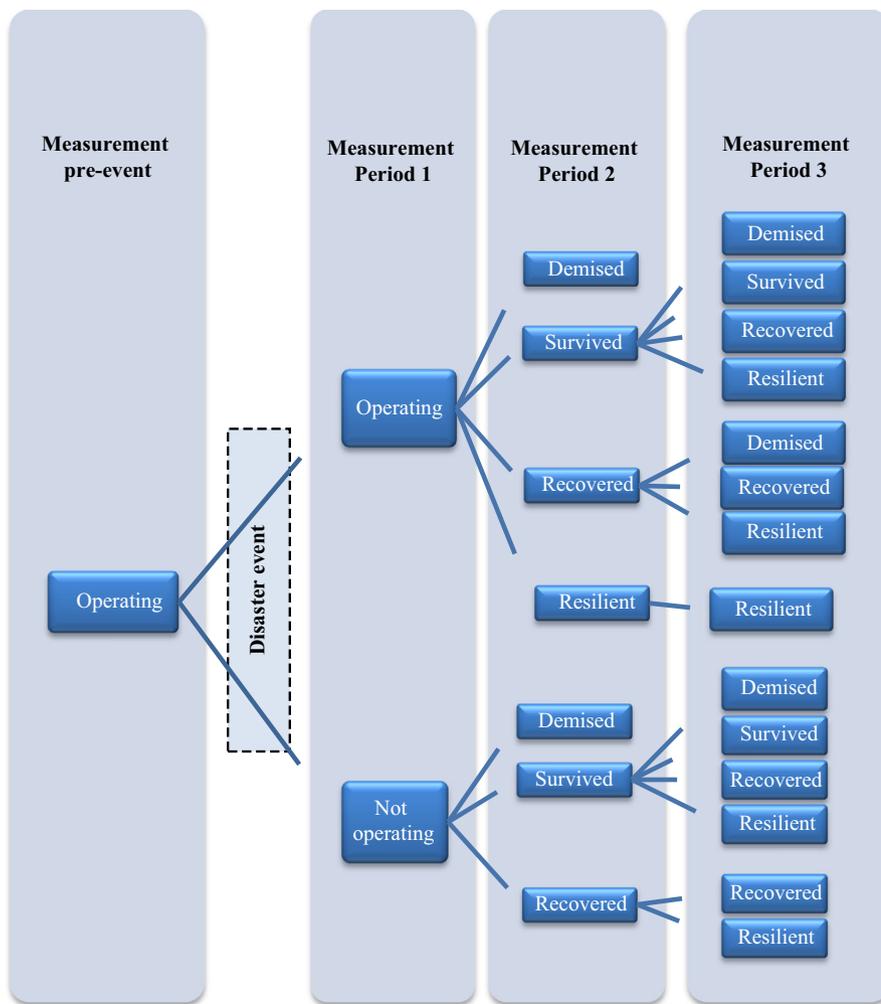


FIGURE 1 Small business disaster recovery framework. Adapted from Marshall and Schrank (2014) [Colour figure can be viewed at wileyonlinelibrary.com]

recovery programmes were sufficient to cover the economic impact in New Orleans in just a few years, Josephson and Marshall (2016) reported a lack of success in the targeted Small Business Administration (SBA) disaster loans to female-owned and coastal small businesses. A qualitative study by Hawkins and Maurer (2010) found lower income families were able to obtain immediate support mainly through pulling family and community support during Katrina. Their study also highlighted the role of social capital for short- and long-term family survival. Marshall, Niehm, Sydnor, and Schrank (2015) were the first to predict post-Katrina operating status based on the pre-existing business characteristics in a continuum time frame. They followed small businesses that were operating before Katrina to examine the factors contributing to demise. This article expands the existing literature by quantifying the pay-offs of social capital on the objective and subjective resilience of small businesses. In other words, we examine how the support received from networks of family, community leaders, and institutions helped keep businesses not only operating but also thriving after Hurricane Katrina.

3.2 | Social capital as a driver of resilience

Social capital is the formal and informal ties that help facilitate the resources available through these networks (Elliott, Haney, & Sams-

Abiodun, 2010). These social ties are useful for the achievement of various outcomes, especially after a disaster (Lin, Cook, & Burt, 2001). Iyer, Kitson, and Toh (2005) defined social capital as “the institutions, relationships, attitudes and values governing interactions amongst people and contributing to economic and social development.” This form of capital generates action that can take the form of sources of information, technological knowledge, market access, and complementary resources (Danes et al., 2008; Putnam, 1995b). In the disaster context, we define the pay-offs received from networks as the goodwill among agents that aids households, businesses, and communities to overcome shocks.

According to the social vulnerability framework, societal conditions are as important as physical resources for the recovery process (Chang & Falit-Baiamonte, 2002; Sauser et al., 2017). Under this concept, households and businesses could pull community and institutional resources to survive, recover, and build resilience. Communities with strong leadership seem to be especially effective at deploying social capital resources from other businesses and households for postdisaster aid (Chamlee-Wright, 2010; Storr, Haeffle-Balch, & Grube, 2015).

Following Aldrich (2012), social capital can be further categorized as bonding, bridging, and linking. Bonding relates to the relationships amongst members of a network who are similar in some form.

Bonding allows individuals sharing homogeneous characteristics (e.g. family and friends) to share information, resources, and support. Bridging refers to the relationships amongst people who are part of a community but are dissimilar in some form (Putnam, 1995a). At last, linking is the extent to which individuals build relationships with institutions and other individuals who have relative power over them (Aldrich, 2012; Chamlee-Wright, 2010; Hawkins & Maurer, 2010).

Following Woolcock (1998), the study investigates how the actions derived from social capital influence small business resilience after Hurricane Katrina. The benefits of bonding capital may include having family and friends helping move equipment and assets away from flooded areas during Katrina. The actions of bridging capital may be illustrated when community leaders pull resources to provide shelter and transportation to families affected by a disaster (Storr et al., 2015). The action of linking capital may include receiving special consideration on a loan from a lending institution.

Using firm-level data, the present article studies how the support received from family and friends, community, and institutional networks—indicators of social capital—contributed to small business resilience post-Katrina. Other social capital factors used by the literature includes having the spouse employed (Marshall & Flaig, 2014), residing in a community with similar ethnic groups, (Kanas, Van Tubergen, & Van der Lippe, 2009), participation in community organizations (Somers, 2009), and information offered through social networks (Hawkins & Maurer, 2010). Additional sources of social capital also include family cooperation, family unpaid labour, and access to credit from the community (Haynes, Danes, & Stafford, 2011; Sanders & Nee, 1996). Other economic studies have supported the hypothesis that social capital can explain individuals' behaviour at a micro level (Runyan, 2006; Woolcock, 1998).

3.3 | Postdisaster small business resilience

Natural disasters tend to affect small businesses, economically and physically, more than larger businesses (Sausser et al., 2017; Schrank et al., 2013; Tierney, 2006). One explanation is small businesses tend to have lower access to physical and financial capital for facing the aftermaths of a disaster (Sokolinskaya & Kupriyanova, 2015). Another reason is the impact of disasters on small business owners is twofold: as business owners and as local residents (Runyan, 2006).

Researchers can use objective or subjective indicators to assess how small businesses overcome disaster. Objective indicators include gross revenue, return on assets, growth in sales, number of employees, and debt level; while subjective indicators may include customer satisfaction, personal development, owner's personal achievement, and owner's perceptions of the success of the business (Danes et al., 2008; Haynes et al., 2011). Objective indicators are effective at describing the measurable change between pre- and postdisaster. In an alternative manner, incorporating subjective factors, such as perceptions and beliefs, brings insight and more depth into disaster recovery research (Chang, 2010). Incorporating objective and subjective measures of success permits an expanded and holistic examination and offers possible interpretations for small business resilience

that is difficult to explain by only objective interpretations. This study uses owners' perceptions of success as a subjective indicator of resilience. We expect that businesses attaining both economic and attitudinal resilience are more likely to achieve long-term success and sustainability.

The determinants of small business resilience borrowed from the SBFT framework are individual, family, business, and community factors. Individual business owner characteristics linked to small business recovery are gender, educational attainment, veteran status, and industry experience (Haynes et al., 2011; Olson et al., 2003; Sorenson, Brigham, Holubik, & Phillips, 2004; Stafford, Bhargava, Danes, Haynes, & Brewton, 2010; Webb, Tierney, & Dahlhamer, 2002). Human capital (i.e. education) offers higher access to information, capital, and managerial skills to recover postdisaster (Haynes et al., 2011). Accumulating industry experience improves the likelihood of recovery, as managerial skills are key to overcome a disaster (Haynes et al., 2011).

We propose family and community factors, such as family demands, goal conflict, functional integrity of family, and family and community interactions also influence small business resilience (Haynes et al., 2011; Stafford et al., 2010). Having a successful family-business interface, which results in support from family members, can help a business to recover from exogenous shocks (Danes, Haberman, & McTavish, 2005; Olson et al., 2003). On the other hand, a conflicting intersection between the business and the family, which creates stress and tension, may increase the likelihood of postdisaster demise. In other words, having strong family ties may improve the economic performance of small businesses. Many communities in the Mississippi Gulf Coast suffered from severe household displacement during Katrina (Runyan, 2006), and many of the displaced households are still geographically dispersed from their communities (Deryugina et al., 2014). Changes in the number of household members are likely to play a role in the resources available to the business after Hurricane Katrina (Marshall et al., 2015).

The postdisaster recovery process is linked to firm characteristics such as industry, size, age of business, emergency planning, predisaster success, disaster experience, and other business characteristics (Marshall et al., 2015; Haynes et al., 2011; Quarantelli, Lawrence, Tierney, & Johnson, 1979; Stafford et al., 2010). Small business recovery varies greatly across industries. Businesses in industries such as manufacturing and wholesale and retail trade are the least likely to recover due to the disaster impact on machinery and inventory (Chang, 2010). Service businesses located in highly displaced communities tend to be greatly affected by disasters due to dependence on local customers. On the other hand, businesses able to draw customers from less affected areas may be more likely to remain operating (Sausser et al., 2017; Webb et al., 2002). The literature reports a higher likelihood of survival among bigger and older businesses (Haynes et al., 2011; Marshall et al., 2015; Stafford et al., 2010). It is likely that losing employees due to disaster can affect the level of human capital needed to deal with recovery activities. Businesses that engaged in predisaster preparedness are better suited to achieve recovery and avoid demise (Webb et al., 2002).

4 | DATA AND METHODOLOGY

4.1 | Data description

The study combined data from two waves of the Small Business Disaster Resilience Survey (SBSD). Mailing lists were obtained from the 2004 Dun & Bradstreet database for December 2004 for small businesses headquartered in Mississippi with <200 employees. The sample included small businesses located in 10 counties in southern Mississippi, which were Forrest, George, Greene, Hancock, Harrison, Jackson, Lamar, Pearl River, Perry, and Stone. These ten counties were in the right front quadrant of Hurricane Katrina and represented a wide range of industries ranging from service businesses to manufacturing, agriculture, and forestry. A random sampling algorithm was applied to the total database of 17,060 businesses. From this population, a random sample of 4,000 businesses had been in operation prior to Hurricane Katrina was drawn for interview purposes.¹

Wave 1 was a 30-minute telephone survey conducted between August and September of 2013 to 2,610 small business owners operating before Hurricane Katrina. The cooperation rate for Wave 1 was 19.1% providing a sample size of 499 businesses. Wave 2 was a mail survey sent between July and August of 2014 to the respondents who had completed Wave 1. The survey questions elicited business and owner demographics, hurricane preparations of both the business and the family, financial information, postdisaster situation (e.g. damage, recovery, or demise), and owner resilience and community linkages.

The subsample for this study included only businesses remained operating after Hurricane Katrina after Wave 1 and Wave 2. Of the 499 businesses surveyed, 373 businesses were operating after Katrina at the time of Wave 1 data collection. Of these, 186 reported their gross revenues went down (survived), 79 reported revenues stayed about the same (recovered), and 105 owners reported higher revenues when compared to pre-Katrina levels (resilient). In terms of attitudinal resilience, 170 owners reported the business is less successful, 161 perceived same levels of success, and 42 reported higher levels of success.

4.2 | Empirical model specification

The article used a two-stage process to assess how social capital influenced small business resilience. Stage 1 included two ordered probit regressions to estimate the probability of social capital influenced: (a) economic business resilience; and (b) attitudinal business resilience. In the same way, Stage 2 disaggregated social capital into bonding, bridging, and linking to determine which category had the greatest impact on (a) economic resilience; and (b) attitudinal resilience. These models shed light on the relevance of social networks to help small businesses through the disaster recovery process.

The ordered probit² is an appropriate framework to model ordinal survey responses where the observed dependent variable has an ordinal scale (Greene, 2003). For instance, post-Katrina gross

revenues may be lower, the same, or higher than before Katrina. As revenue is a continuous variable, the rating scheme follows a naturally ordered scale. This study assumed the recovery process has a natural ordering (low to high), but the distances between adjacent levels of operating businesses are unknown (Greene, 2003). The same rationale applied to model both economic and attitudinal resilience.

The ordered probit model is based on a latent continuous variable y_i^* underlying the ordinal responses observed. The latent variable is a linear combination of some observables X and a disturbance term ε that has a normal distribution. In particular, letting $i = 1, 2, \dots, n$ index the business, and for the case in which there are three ordered outcomes (i.e. $y_i \in [0,1,2]$):

$$y_i^* = X_i\beta + \varepsilon_i \quad (1)$$

in which y_i^* is the unobserved latent variable and y_i is the observed ordinal variable

$$\begin{aligned} y_i &= 0 && \text{if } y_i^* \leq 0 \\ y_i &= 1 && \text{if } 0 < y_i^* \leq \mu_1 \\ y_i &= 2 && \text{if } \mu_1 < y_i^* \end{aligned}$$

such that μ_1 and β are unknown parameters to be estimated. We then have the following probabilities:

$$\begin{aligned} \Pr(y_i = 0 | X_i = x) &= \Phi(-X_i\beta) \\ \Pr(y_i = 1 | X_i = x) &= \Phi(\mu_1 - X_i\beta) - \Phi(-X_i\beta) \\ \Pr(y_i = 2 | X_i = x) &= 1 - \Phi(\mu_1 - X_i\beta) \end{aligned}$$

where $\Phi(\cdot)$ is the standard normal cumulative distribution function.

4.2.1 | Stage 1. Does social capital affect small business economic and attitudinal resilience post-Katrina?

Economic resilience

Equation 4 depicts the first model specification in first stage. The first probit assessed the level of economic resilience by comparing gross annual revenues pre- and post-Katrina. The dependent variable of the first ordered probit regression *revenues* took the value of $y = 0$ if the business survived, $y = 1$ if the business recovered, $y = 2$ if the business was resilient. In other words, $y = 0$ if the business owner reported in 2013 its gross revenues went down, $y = 1$ if revenues stayed about the same, and $y = 2$ if revenues were higher when compared to pre-Katrina level.

$$\Pr(Y_i = 1 | X_i = x) = \Phi(X_i\beta) = \Phi(\beta_0 + \beta_1 \text{scapital}_i + \beta_2 \text{community}_i + \text{individual}_i\beta_3 + \text{family}_i\beta_4 + \text{business}_i\beta_5) \quad (2)$$

in which $X = (\text{constant, social capital, community, individual, family, business})$ is a vector of covariates, and $\beta = (\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5)'$ is a vector of unknown constants.

The key explanatory variables in Equation 4 are the business' social capital before, during, and after Katrina. The variable *scapital* was equal to 1 if the business owner received the benefits (support) derived from social networks (i.e. friends, family, community leaders,

or institutional networks). The variable *community* indicates business owner participation in the community, as an essential part of social capital is the give and take between individuals and institutions. The survey minimized the effect of other economic shocks on business resilience by asking respondents to focus their responses to the time of recovery during Hurricane Katrina.

Iyer et al. (2005) found highly participative communities tend to show higher generation of social capital. Table 1 displays the covariates used in this study. A correlation analysis indicated there is no multicollinearity between variations of the independent variables.

The set of covariates *individual* corresponded to the set of control variables related to business owner demographics such as gender, educational attainment, veteran status, and industry experience. Incorporating family variables, when modeling business resilience, gives strong insight into the family business interaction. The set of covariates *family* included the change in number of household members since Katrina and an indicator of conflict between household and business. The literature has reported family members tend to pool resources to assure business profitability, especially in times of stress (Haynes et al., 2011; Stafford et al., 2010).

TABLE 1 Variables and definitions

Category	Variable	Description
Dependent variable	Revenues	Recovery measured by comparing gross revenues between pre- and post-Katrina. Revenues went down ($y = 0$), stayed about the same ($y = 1$), or went up ($y = 2$)
	Success	Comparison of owners' perceptions of business success between pre- and post-Katrina. Business is less successful ($y = 0$), similarly successful ($y = 1$), or more successful ($y = 2$)
Key independent variables	Social capital	1 = business owner received help from family, friends, community, and institutions to recover from Katrina
	Bonding	1 = business owner received help from family and friends during Katrina
	Bridging	1 = business owner agrees or strongly agrees that community leaders helped local businesses during the recovery of Katrina
	Linking	1 = business owner received help from SBA, FEMA, or special consideration on loans or payments due from lenders or suppliers
	Community participation	1 = respondent participates in any business, social, special interest, sports, or religious groups in the community
Individual variables	Female	1 = if owner is female
	College	1 = business owner highest level of education is bachelor's degree, some graduate work or graduate or professional degree
	Veteran	1 = if business owner is a veteran
	Experience	Number of years business owner has worked in the industry
Family variables	Change household number	Change in number of people living in the household including respondent between pre- and post-Katrina
	No conflict	1 = the needs of the household and family never conflicted with the needs of the business
Business variables	Sole proprietor	1 = if business structure is sole proprietorship
	Years own	Years of business ownership
	Change employee	Change in number of employees other than business owner between pre- and post-Katrina
	No cash problem	1 = if business never experienced cash flow problems pre- or post-Katrina
	Disaster experience	1 = if business had ever gone through any major disaster that caused the closure of business for more than 24 hours or caused significant damage to business or residence
	Emergency	1 = if business had an emergency plan pre-Katrina
	Customer came	1 = if most customers came to the place of business before Katrina
	Home-based	1 = if business mostly operated from home at the time of Hurricane Katrina
	Agriculture	1 = if line of business is agriculture
	Construction	1 = if line of business is construction
	Manufacture	1 = if line of business is manufacture
	Transportation	1 = if line of business is transportation
	Wholesale	1 = if line of business is wholesale
	Retail	1 = if line of business is retail
	Finance	1 = if line of business is finance
	Services	1 = if line of business is services
Coastal county	1 = if business is located in coastal counties such as Hancock, Harrison, and Jackson	

The set of covariates *business* corresponded to variables related to business demographics, mitigation, and disaster assistance. The study included variables related to the legal structure of the business, the number of years of business ownership, change in number of employees since Katrina, if the business experienced cash flow problems before or after Katrina, business success pre-Katrina, disaster experience, emergency plans pre-Katrina, and business industry. The dummy variable *changerev* controls for changes in revenue between Wave 1 and Wave 2 that may lead to change in social capital perceptions and self-reporting bias. Marshall et al. (2015) found businesses located in coastal counties were the most affected by the hurricane due to flooding and storm surges.

Attitudinal resilience

The second model in Stage 1 uses the variable *success* as dependent variable, which took the value of $y = 0$ if the owner perceived the business was less successful, $y = 1$ if the business was similarly successful, or $y = 2$ if the business was more successful than pre-Katrina. We followed Marshall and Schrank (2014) to base the order of the dependent variable on terms of attitudinal success. This regression used the model identification stated in Equation 4.

4.2.2 | Stage 2. What type of social capital has the greatest impact on small business resilience?

Equation 5 illustrates the second model identification used to disaggregate the types of social capital. Equation 5 aims to assess which type of social capital had the greatest impact on small business resilience post-Katrina. Following Aldrich (2012) and Hawkins and Maurer (2010), we categorized the pay-offs from social capital as bonding, bridging, and linking. In Stage 2, the second model specification replaced *scapital* with each type of social capital: *bonding*, *bridging*, and *linking*. Bonding social capital was equal to 1 if the respondent received benefits from family and friends networks during the recovery period of Katrina. The survey asked business owners "Please tell me whether or not you received the help that you needed from family and friends during Hurricane Katrina or its aftermath."

Bridging social capital was equal to 1 if the business owner agreed or strongly agreed he/she received help from community during the recovery process of Katrina. The questionnaire asked "Please indicate the extent to which you agree that during the recovery period after Katrina, community leaders worked toward what was best for local businesses." At last, linking social capital was equal to 1 if the owner responded he/she received help from institutions and organizations during the recovery period of Katrina. In particular, the questionnaire asked whether the household received any disaster assistance from FEMA or whether the business received financial assistance from the SBA or special consideration on loans or payments due from lenders or suppliers.

Similar to Stage 1, Stage 2 used two ordered probit regressions to measure the impact of bonding, bridging, and linking on (a) economic resilience (i.e. change in revenues); and (b) attitudinal resilience (i.e. change in perceptions of business success). Stage 2 used

the set of covariates *individual*, *family*, *business*, and *community* used in Equation 4.

$$\Pr(Y_i = 1 | X_i = x) = \Phi(X_i \beta) = \Phi(\beta_0 + \beta_1 \text{bonding}_i + \beta_2 \text{bridging}_i + \beta_3 \text{linking}_i + \text{individual}_i \beta_4 + \text{family}_i \beta_5 + \text{business}_i \beta_6 + \text{community}_i \beta_7) \quad (3)$$

in which $X = (1, \text{social capital, individual, family, business, community})$ is a vector of covariates, and $\beta = (\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7)'$ is a vector of unknown constants.

5 | EMPIRICAL RESULTS

5.1 | Summary statistics

This section illustrates the descriptive statistical results of the variables used in the study. First, we explore the descriptive statistics for resilience as the measure of gross revenues (i.e. economic resilience). Second, we present the descriptive statistics for small businesses that were less, similarly, or more successful between pre- and post-Katrina (i.e. attitudinal resilience). In addition, this section illustrates the relationship between social capital and small business resilience.

The results show a larger number of business owners were economically resilient (28%) when compared to those who perceived their business to be more successful post-Katrina (11%). Of those economic resilient businesses, 8% of owners perceived their business to be less successful, 62% perceived their business as equally successful, and 30% perceived their business as more successful. It seems business owners who were economically resilient may not have perceived their businesses as being more successful. Incorporating objective and subjective measures of success can help us examine the long-term sustainability of small businesses. By doing so, we offer possible interpretations for small business resilience that are difficult to explain by only objective interpretations.

5.1.1 | Economic resilience

Table 2 displays means and standard deviations for the continuous and categorical variables of survived, recovered, and resilient small businesses measured by the change in gross revenues between pre- and post-Katrina. The sample obtained from Wave 1 was comprised of 373 small businesses that were operating at the time of the first survey. Following the SBDRF, small businesses were categorized as survived (186), recovered (79), and resilient (105) if revenues were lower, same, or higher than before Katrina, respectively.

A smaller percentage of recovered business owners (70%) received the benefits derived from social capital when compared to resilient businesses (83%). Among the different forms of social capital, the benefits from bridging were reported by more economic resilient businesses than survived ($p < 0.05$). The benefits from linking capital were reported by a higher share of survived and resilient businesses than those that reported to have recovered the level of gross revenues. Most of the small business owners participated in

TABLE 2 Descriptive statistics of characteristics of small businesses

Variable	Full Sample		Survived		Recovered		Resilient	
	N = 370		N = 186		N = 79		N = 105	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Social capital ^a	0.77	0.42	0.80	0.40	0.70	0.46 ^c	0.83	0.38
Bonding ^a	0.17	0.38	0.18	0.38	0.15	0.36	0.19	0.39
Bridging ^a	0.58	0.49	0.54	0.50	0.64	0.48	0.66	0.48 ^c
Linking ^a	0.53	0.50	0.61	0.49	0.42	0.50 ^c	0.55	0.50
Community participation ^a	0.76	0.43	0.71	0.46	0.76	0.43	0.87	0.34 ^c
Female ^a	0.31	0.46	0.33	0.47	0.30	0.46	0.21	0.41 ^c
College ^a	0.38	0.49	0.37	0.48	0.47	0.50	0.48	0.50 ^c
Veteran ^a	0.19	0.40	0.17	0.37	0.22	0.42	0.21	0.41
Experience	29.27	12.40	30.60	11.90	31.86	10.90	28.24	11.90 ^c
Change household number ^b	-0.37	1.13	-0.36	1.36	-0.30	0.74	-0.37	1.01
No conflict ^a	0.35	0.48	0.26	0.44	0.48	0.50 ^c	0.28	0.45
Sole proprietor ^a	0.46	0.50	0.52	0.50	0.44	0.50	0.30	0.46 ^c
Years ownership	22.18	10.43	22.46	10.39	24.95	10.52 ^c	20.13	9.95 ^c
Change employee number ^b	-0.52	11.82	-1.84	6.45	-1.11	4.22	2.22	19.86 ^c
No cash problem ^a	0.24	0.43	0.19	0.39	0.39	0.49 ^c	0.37	0.48 ^c
Disaster experience ^a	0.49	0.50	0.49	0.50	0.42	0.50	0.50	0.50
Emergency ^a	0.48	0.50	0.45	0.50	0.48	0.50	0.49	0.50
Customer came ^a	0.54	0.50	0.49	0.50	0.62	0.49 ^c	0.51	0.50
Home-based ^a	0.31	0.46	0.35	0.48	0.22	0.41 ^c	0.30	0.46
Agriculture ^a	0.04	0.20	0.04	0.20	0.03	0.16	0.04	0.19
Construction ^a	0.08	0.27	0.11	0.31	0.08	0.27	0.04	0.19 ^c
Manufacture ^a	0.04	0.20	0.02	0.15	0.05	0.22	0.06	0.23
Transportation ^a	0.03	0.17	0.03	0.18	0.01	0.01 ^c	0.04	0.19
Wholesale ^a	0.05	0.22	0.06	0.24	0.03	0.16	0.07	0.25
Retail ^a	0.19	0.39	0.17	0.37	0.23	0.42	0.25	0.43 ^c
Finance ^a	0.09	0.28	0.08	0.26	0.10	0.30	0.11	0.32
Services ^a	0.34	0.47	0.41	0.49	0.43	0.50	0.30	0.46 ^c
Coastal county ^a	0.69	0.46	0.72	0.45	0.63	0.49	0.63	0.49 ^c

Notes. Survived, recovered, and resilient businesses are defined by the change in gross revenues pre- and post-Katrina

^aThe mean value for dummy variables represents the percentage of individuals showing that characteristic. ^bIndicates an index variable that denotes the change in variable from pre-Katrina to the time of the survey. ^cThe difference of the variable mean of the group and the variable mean of survived small businesses is statistically different from zero ($p < 0.05$).

business, social, special interests, sports, or religious groups. This proportion was significantly higher for resilient business owners (87%) than survived business owners (71%; $p < 0.05$).

Thirty-one per cent of small business owners were women, with a larger share among survived businesses (33%) than resilient (21%; $p < 0.05$). Almost 35% of business owners reported the needs of the household never conflicted with the needs of the business. Forty-eight per cent of recovered businesses reported the lack of business-family conflicts, a significantly higher proportion than survived businesses ($p < 0.05$). The lack of family-business conflict may translate to higher level of business commitment to disaster recovery.

Over 69% of small businesses were located in coastal counties, and this proportion was larger for survived than recovered and resilient small businesses ($p < 0.05$).

5.1.2 | Attitudinal resilience

Attitudinal resilience is defined by the comparison of owners' perceptions of success between pre- and post-Katrina periods. Table 3 displays means and standard deviations for the continuous and categorical variables for the group of less, similarly, and more successful businesses. The sample obtained from Wave 1 was comprised of 373 small businesses that remained operating at the time of the first survey. Small businesses were categorized as less (170), equally (161), or more successful (42).

Similar to economically recovered businesses, a smaller percentage of business owners that perceived to be recovered received the benefits derived from social capital when compared to resilient businesses. Among the different forms of social capital, the benefits from

TABLE 3 Descriptive statistics of characteristics of small businesses

Variable	Full Sample		Survived		Recovered		Resilient	
	N = 373		N = 170		N = 161		N = 42	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Social capital ^a	0.77	0.42	0.83	0.38	0.73	0.44 ^c	0.81	0.40
Bonding ^a	0.17	0.38	0.20	0.40	0.13	0.34 ^c	0.24	0.43
Bridging ^a	0.58	0.49	0.52	0.50	0.66	0.47 ^c	0.62	0.49
Linking ^a	0.53	0.50	0.63	0.48	0.44	0.50 ^c	0.69	0.47
Community participation ^a	0.76	0.43	0.73	0.45	0.76	0.43	0.90	0.30 ^c
Female ^a	0.31	0.46	0.32	0.47	0.27	0.45	0.24	0.43
College ^a	0.38	0.49	0.35	0.48	0.48	0.50 ^c	0.48	0.51
Veteran ^a	0.19	0.40	0.18	0.38	0.20	0.40	0.17	0.38
Experience	29.27	12.40	31.15	11.77	30.04	11.28	26.83	12.90 ^c
Change household number ^b	-0.37	1.13	-0.33	1.23	-0.42	1.11	-0.26	1.06
No conflict ^a	0.35	0.48	0.28	0.45	0.38	0.49 ^c	0.22	0.42
Sole proprietor ^a	0.46	0.50	0.54	0.50	0.37	0.48 ^c	0.31	0.47 ^c
Years ownership	22.18	10.43	22.94	11.04	22.63	10.03	19.00	8.37 ^c
Change employee number ^b	-0.52	11.82	-1.71	5.02	-0.88	7.17	5.12	29.20 ^c
No cash problem ^a	0.24	0.43	0.16	0.37	0.40	0.49 ^c	0.32	0.47 ^c
Disaster experience ^a	0.49	0.50	0.47	0.50	0.49	0.50	0.52	0.51
Emergency ^a	0.48	0.50	0.46	0.50	0.47	0.50	0.56	0.50
Customer came ^a	0.54	0.50	0.49	0.50	0.53	0.50	0.66	0.48 ^c
Home-based ^a	0.31	0.46	0.35	0.48	0.27	0.45	0.29	0.46
Agriculture ^a	0.04	0.20	0.02	0.15	0.05	0.22	0.05	0.22
Construction ^a	0.08	0.27	0.09	0.29	0.08	0.27	0.02	0.15
Manufacture ^a	0.04	0.20	0.02	0.15	0.04	0.19	0.10	0.30 ^c
Transportation ^a	0.03	0.17	0.03	0.17	0.02	0.16	0.02	0.15
Wholesale ^a	0.05	0.22	0.07	0.26	0.04	0.19	0.05	0.22
Retail ^a	0.19	0.39	0.15	0.36	0.22	0.42 ^c	0.31	0.47 ^c
Finance ^a	0.09	0.28	0.08	0.27	0.11	0.32	0.10	0.30
Services ^a	0.34	0.47	0.44	0.50	0.35	0.48	0.26	0.45 ^c
Coastal county ^a	0.69	0.46	0.76	0.43	0.59	0.49 ^c	0.68	0.47

Notes. Survived, recovered, and resilient businesses are defined by the comparison of perceptions of business success pre- and post-Katrina.

^aThe mean value for dummy variables represents the percentage of individuals showing that characteristic. ^bIndicates an index variable that denotes the change in variable from pre-Katrina to the time of the survey. ^cThe difference of the variable mean of the group and the variable mean of survived businesses is statistically different from zero ($p < 0.05$).

bonding capital were reported by a smaller number of recovered businesses when compared to their resilient counterparts. The benefits from bridging were reported by more perceived recovered and resilient businesses than those that just survived ($p < 0.05$). The benefits from linking capital were reported by a higher share of survived and resilient businesses than those that reported to have equally successful than before Katrina.

Table 3 illustrates that fewer survived business owners had college education than recovered and resilient businesses ($p < 0.05$). Similar to economic resilience, more successful business owners had significantly fewer years of industry experience (26 years) when compared to those that just survived (31 years) or recovered

($p < 0.05$). Similar to economic resilient businesses, a smaller number of attitudinal resilient business owners were sole proprietors (31%) when compared survived businesses ($p < 0.05$).

The number of employees post-Katrina increased for resilient businesses when compared to their survived counterparts ($p < 0.05$). Fewer resilient and recovered businesses faced cash flow problems compared to survived businesses ($p < 0.05$). The industry in which the firm operates seems to be important for attitudinal resilience. More resilient businesses reported to be in the retail and manufacture sectors than their survived counterparts ($p < 0.05$). On the other hand, more services businesses were reported as survived when compared to resilient businesses ($p < 0.05$).

6 | RESULTS AND DISCUSSION

6.1 | Stage 1. Does social capital explain small business resilience?

The ordered probit analysis provides the results of the pay-offs of social capital on economic and attitudinal resilience. Table 4 shows that the probability of being economically resilient is positive and statistically significantly correlated with the pay-offs from social capital ($p < 0.01$). Small businesses that received benefits derived from social capital during the recovery of Hurricane Katrina were 4% more likely to be economically resilient ($p < 0.01$). On the other

TABLE 4 Ordered probit regression results for small business resilience as the result of social capital

	Economic resilience		Attitudinal resilience	
	Coeff	Marginal effect	Coeff	Marginal effect
Social capital	0.12	3.99*	-0.10	-1.50
Community participation ^a	0.11	3.56	-0.01	-0.13
Female ^a	-0.16	-5.41	-0.15	-2.32
College ^a	0.02	0.64	0.06	0.87
Veteran ^a	0.11	3.85	0.31	4.88
Experience	-0.01	-0.43	-0.02	-0.37**
Change household number ^b	0.00	0.12	0.05	0.84
No conflict ^a	-0.24	-8.21	-0.37	-5.80*
Sole proprietor ^a	-0.45	-15.26**	-0.41	-6.42**
Years ownership	0.01	0.01	0.00	0.01
Change employee number ^b	0.02	0.53	0.01	0.22
No cash problem ^a	0.56	18.77***	0.47	7.34**
Disaster experience ^a	-0.01	-0.44	0.04	0.68
Emergency ^a	0.08	2.78	0.10	1.51
Customer came ^a	-0.06	-2.13	-0.02	-0.29
Home-based ^a	0.02	0.83	-0.15	-2.33
Agriculture ^a	-0.08	-2.60	-0.02	-0.30
Construction ^a	-0.43	-14.52	-0.38	-5.92
Manufacture ^a	0.14	4.85	0.04	0.57
Transportation ^a	-0.06	-2.04	-0.46	-7.12
Wholesale ^a	-0.61	-20.39	-1.00	-15.55**
Finance ^a	-0.25	-8.28	-0.34	-5.26
Services ^a	-0.45	-15.11**	-0.66	-10.31***
Coastal county ^a	-0.19	-6.35	-0.30	-4.75
cut1	-0.71		-1.57	
cut2	-0.07		-0.07	
N Obs	198		200	
$p > \chi^2$	0.00		0.00	

Note. Marginal effects are expressed in percent points.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

hand, social capital pay-offs did not appear to influence attitudinal resilience. Community participation was also not statistically significant in either model.

A major finding is the empirical evidence that following a disaster, the linkages with family and friends, community leaders, and institutions can help small businesses thrive after a natural disaster. Recent studies addressed the role of social capital on community resilience indicators (Aldrich, 2012; Elliott et al., 2010). These studies indicate that the benefits derived from social capital include key resources useful such as information, physical, and emotional resources.

Increasing the number of years of experience decreased the probability that business owners perceived themselves as resilient ($p < 0.05$). It is likely that younger and less experienced owners had positive perceptions of their success and capability to overcome natural disasters. Sole proprietors were 15% less likely to be economic resilient ($p < 0.05$) and 6% less likely to report attitudinal resilience ($p < 0.05$). We expect that businesses with a less formal business structure were more likely to have lower access to resources for the recovery period. The lack of time and resources may have also affected their lack of engagement in risk and disaster mitigation activities to overcome a natural disaster.

Financial managerial skills are important during a crisis. Table 4 illustrates that business owners who did not experience cash flow problems were 19% more likely to be economic resilient ($p < 0.01$) and 7% more likely to experience attitudinal resilience ($p < 0.05$). Runyan (2006) reported that cash flow problems exacerbate the effects of an external shock. It is likely that disasters disrupt the money inflow due to market contraction, time to resume operation, and loss of assets and inventory. Managerial skills and long-term vision that balance business finances with family needs can help small business owners to avoid cash flow problems during the aftermath of a natural disaster.

We found service-oriented businesses were 15% less likely to be economically resilient ($p < 0.05$) and 10% less likely to be perceived as resilient by their owners ($p < 0.01$). In the same way, business owners engaged in wholesale trade were 16% less likely to perceive being resilient ($p < 0.01$). While the high mobility of service and wholesale businesses may have helped them to draw customers from less affected areas, there is evidence that service and trade sectors were more vulnerable to the aftermath of a disaster due to competition in these economic sectors (Webb et al., 2002). The severity of Hurricane Katrina heavily affected the disposable income of a large proportion of the local clientele, thus hurting local demand.

6.2 | Stage 2. What type of social capital has the greatest impact for building small business resilience?

Table 5 displays the coefficients and marginal effects of the ordered probit regression analyses the impact of receiving the pay-offs from bonding, bridging, and linking on the resilience of small businesses. The results suggest the pay-offs of bridging and linking social capital

are what drove economic and attitudinal resilience post-Katrina. Small business owners who were able to bridge and receive help from community networks were 24% more likely to be economically resilient ($p < 0.01$) and 16% more likely to perceive resilience ($p < 0.01$). We expect communities with strong ties could effectively adjust resources in the aftershock of natural disasters. These communities may be able to provide sufficient resources and support to keep small businesses resilient. These findings are consistent with the community resilience literature that proposes collective action can bring the necessary resources to overcome disasters (Adger,

2010). This study proposes strong community ties, which build community resilience, may have spill over effects that foster small business resilience during crisis.

Business owners who received the benefits derived from linking capital were 21% more likely to be economically resilient ($p < 0.05$). The results suggests support from government and financial institutions—such as FEMA, SBA, and lenders—can be crucial to foster economic success of small businesses after a natural disaster. It seems those households who received immediate assistance from FEMA or those businesses that obtained assistance from the SBA or lenders were able to not only survive but also thrive after Hurricane Katrina.

TABLE 5 Ordered probit regression results for small business resilience as the result of bonding, bridging, and linking social capital

	Economic resilience		Attitudinal resilience	
	Coeff	Marginal effect	Coeff	Marginal effect
Bonding	-0.03	-1.05	-0.08	-1.82
Bridging	0.60	23.75***	0.69	16.18***
Linking	0.52	20.45**	0.34	8.07
Community participation ^a	0.06	2.29	0.00	0.07
Female ^a	-0.16	-6.41	-0.15	-3.47
College ^a	0.02	0.77	-0.03	-0.66
Veteran ^a	0.32	12.83	0.29	6.82
Experience	0.01	0.26	-0.01	-0.30
Change household number ^b	0.06	2.22	0.13	3.14
No conflict ^a	-0.13	-5.08	-0.48	-11.22*
Sole proprietor ^a	-0.50	-19.86*	-0.48	-11.36*
Years ownership	0.00	-0.16	-0.01	-0.25
Change employee number ^b	0.02	0.90	0.01	0.14
No cash problem ^a	0.60	23.56**	0.32	7.49
Disaster experience ^a	-0.16	-6.53	-0.10	-2.39
Emergency ^a	0.18	7.28	0.13	2.95
Customer came ^a	0.09	3.38	0.17	3.99
Home-based ^a	0.38	14.97	0.00	0.10
Agriculture ^a	0.10	3.99	0.41	9.70
Construction ^a	-1.12	-44.39**	-0.61	-14.42
Manufacture ^a	-0.09	-3.46	-0.22	-5.29
Transportation ^a	0.80	31.75	-0.58	-13.70
Wholesale ^a	-0.81	-31.99	-1.12	-26.34**
Finance ^a	-0.53	-20.81	-0.58	-13.75
Services ^a	-0.65	-25.73**	-0.98	-23.06***
Coastal county ^a	-0.19	-7.65	-0.33	-7.74
cut1	2.43		-1.12	
cut2	0.97		0.50	
N Obs	144		146	
$p > \chi^2$	0.00		0.00	

Note. Marginal effects are expressed in per cent points.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 5 shows bonding social capital was not significantly associated with small business economic or attitudinal resilience. It is likely that Hurricane Katrina equally stressed family and business due to the family–business interconnection, and thus, the action of bonding capital did not affect business resilience. After a disaster, households may not be able to prioritize business over family needs, and family resources may be directed towards family recovery rather than business aid. In a consistent manner, the data show over 62% of business owners prioritized taking care of family over business during Katrina. Work from Haynes, Danes, Schrank, and Lee (in press) suggested that family disruptions served as a motivator for business owners to adjust resources (i.e. family adaptive capacity) and assure business success.

The lack of significance of linking capital on attitudinal resilience may be due to the severity of Katrina, the short-term effect of FEMA assistance, and the low number of businesses receiving SBA loans (64 businesses), or the long-term impact of still having liabilities to lenders and suppliers. In the same way, Haynes et al. (in press) found that external assistance from government programmes helped businesses to survive Hurricane Katrina, but had no effect on owner's perception of being successful. As reported by Josephson and Marshall (2016), financial help from institutions such as SBA tend to omit under-represented and minorities businesses, which may weaken the effectiveness of linking social capital.

7 | IMPLICATIONS AND CONCLUSION

Resilience is the capacity of individuals, households, businesses, and communities to adapt to external shocks and ultimately thrive. Based on studies on East Asian communities, Stiglitz (1996) suggests one of the most important features for business recovery is the ability to adapt and respond to disruptions. During Hurricane Katrina, most of the disaster management focused on providing the infrastructure, physical assets, and monetary assistance to recover affected communities. While it is common to foster postdisaster resilience through the lens of physical and financial resources, the emphasis is shifting towards developing strong community-based networks that can promptly respond to disasters.

The major contribution of this article is the evidence social capital is a key asset for long-term resilience at the small business level. Eight years after Hurricane Katrina, small businesses that had access

to social capital were financially stronger and business owners perceived their business as more successful relative to pre-Katrina. Our findings are consistent with the recent wave of literature that highlights the importance of community-based resources to face disasters. The results illustrate how small business owners connected to their communities were more likely to overcome disaster and build resilience. The more links business owners have to the community—the more social capital they have—the better off they will be when they encounter a natural disaster. In other words, self-reliance alone cannot assure long-term postdisaster recovery and resilience.

Social networks are key to building resilience. The study proposed a proxy for a holistic study of small business resilience by comparing pre- and postdisaster revenues and perceptions of success. This study used a disaggregated measurement of social capital to identify the mechanisms in which the benefits derived from social capital drove small business resilience. We incorporated several social capital indicators to categorize the mechanisms of bonding, bridging, and linking social capital (Aldrich, 2012).

Our results suggest bridging and linking, rather than bonding, can significantly drive small business resilience post-Katrina. One explanation is that during disaster recovery, households may prioritize family over business. However, community leaders may be able to pool resources across sectors and organizations to keep small businesses alive. In the same way, the immediate support from first responders, government, and financial institutions can have long-lasting effects on the economic resilience of small businesses.

Policymakers should consider strategies that encourage multisector partnerships between businesses, community organizations, and government. These partnerships can foster bridging social capital, which would result in improved communication and coordination efforts during crisis. Building resilient communities is especially important as natural disasters become more frequent and federal aid tends to be insufficient to cover the economic aftermath. Community-oriented policies are especially important to assist vulnerable groups, when federal resources may not be enough relief for low-wealth families, minorities, and small businesses.

We propose fostering social linkages can improve the well-being of individuals, households, businesses, and the entire community. Small business owners, community leaders, scholars, and policymakers can use this information to target assistance that builds social capital and increases resilience. Incentives and interventions should support the creation and strengthening of community linkages through civic participation and leadership development. One such approach to foster social capital is to develop campaigns that strengthen communities' ties and improve the dialogue and trust among community, households, and institutions. Another approach may be to facilitate the process of SBA, disaster loan applications, and FEMA grants to make this process more transparent to small business owners and target minorities (Josephson & Marshall, 2016).

We also contribute to the literature by shedding light on what it takes for small businesses to thrive after a natural disaster. We expect the combination of social capital with other types of capital

may enable communities to respond and recover promptly from disruptions. Management skills are key to coping with a disaster. Small businesses with a healthy financial trajectory are more likely to identify sources of capital to respond and adapt to crises. In the same way, managerial skills are vital to strategically allocate resources that serve both family and business in postdisaster recovery. Nowell, Bodkin, and Bayoumi (2017) suggested that cross-functionality, or the management of resources across different systems, can help risk management and disaster resilience.

Disasters have a way of manifesting pre-existing social and economic conditions and as such, exacerbate individuals and businesses with lackluster social resources and performance. Economic resources are a chief, but not sole, mechanism of recovery. Public policies developed to bolster informal, ongoing bridging networks pre-disaster should help replenish community and business actors' will to recover, postdisaster. This complements the contemporary movement away from elevating the support external aid plays during disaster recovery to more critical and informed than local resolutions by business community members, the true first responders. Teo, Lee, and Lim (2017) proposed a model to explain how local leadership should be able to draw upon tangible factors (i.e. financial and infrastructure resources) and intangible factors (i.e. trust, reflection, and learning) to foster resilience after crisis.

This article sheds light on the drivers of postdisaster small business resilience. While the intention of the present study did not include disaggregating pay-offs of social capital, additional investigations might include how disaster social capital networks (networks individuals perceive as able to provide assistance for disaster-related activities) relate to routine social capital networks. Further research could investigate additional metrics to measure and evaluate the role of social capital on small business resilience. One limitation of the study is the possibility of reporting bias or bad memories from survey respondents. To address this, the study controlled for changes in revenue between waves, which aims to account for changes between surveys that may lead to change in social capital perceptions and self-reporting bias. We minimized the effect of other economic shocks and bad memories by asking respondents to focus their responses to the time of recovery during Hurricane Katrina.

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ENDNOTES

¹ The methodology used to draw the sample is described in Schrank et al. (2013).

² The article also used a multinomial probit regression to assess the pay-off of social capital on small business resilience post-Katrina. We obtained similar statistically significant results between the ordered and

the multinomial probit regressions. For the sake of simplicity, the study only presents the results from the ordered probit.

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