Appendix C
Study 3 Methods

Small Business Demise and Recovery after a Natural Disaster

To extend previous research and to address some of its limitations, we propose to include owners of non-surviving businesses, and to incorporate family issues and owner risk-related characteristics and community variables into the study. To accomplish this general goal, we propose to conduct a study based on the SFBM theoretical model.

Study 3 Phase I Objectives, sample selection

1) To identify and locate owners of small businesses impacted by a natural disaster.

2) To utilize results to devise a plan for representative sampling for a comprehensive, longitudinal study of recovery and demise for small businesses.

Sample selection methods

To achieve the sample selection objectives, small businesses with 200 or fewer employees, operating prior to a natural event would be identified and individually accounted for post-event. A detailed 2005 mailing list that includes approximately 6,900 business and owner names and geo-coded addresses, as well as SIC industrial codes (a proxy for products and services offered), employee size, and 2005 revenues will be purchased from Genesys Marketing to establish the pre-disaster business population in the selected counties. One or more post-event lists (2006, 2007 or 2008) would also be purchased.

One advantage of these purchased lists is that business locations are geo-coded. Jarmin & Miranda (2006) note that identification of damaged establishments located precisely on a map provides more accurate characterization of affected businesses than would be possible by using other methods. Geo-coded business addresses can be matched to existing government data files such as FEMA Hurricane Katrina shapefiles that depict the nature and degree of damage in the affected geographic area. We plan to do that for Hancock, Harrison and Jackson county businesses using the geo-codes for the businesses that are provided in the purchased lists.

A second advantage of purchasing geo-coded lists is that it will enable the researchers to focus initial efforts toward locating owners of missing businesses (either because of demise, delay or re-invention under a different name or location so that they can be appropriately included or excluded in phase II. Geo-coding enables more efficient search for the owners of failed and "missing" businesses by targeting locations in specific districts simultaneously. It is likely that a significant portion of them will be located in defined geographic areas with specific current infrastructure or market barriers to recovery. Locating owners of "missing" businesses will not be easy, but pinpointing a location will readily enable us to match pre-event and post-event locations to identify

any businesses that may be been sold to new owners or reincarnated under new names. In-the-field networking will also be more productive because neighbors and local records can provide useful leads enabling the research team to locate the current owners of these businesses.

A third advantage of Genesys mailing lists is that the income data reported in them is based on credit data assembled by Dun & Bradstreet, and is less likely to be underreported, a problem typically presented by some cash and carry SBA business loan applicants whose IRS verifications for loans did not support their applications (Mittler, 1997, p. 138). The SBA loan approval process requires income information and verification to assess the credit worthiness of the applicant. An additional asset is that this Genesys supplied revenue data will be available for all businesses in the database, not only those that may have applied for disaster relief.

Pre- and post-event lists would be compared. Businesses shown on both lists will be initially classified as "in operation". Businesses that appear only on the second list will be initially classified as "new" and their continued operation would be confirmed with 2006-2009 phone books. Businesses appearing on the first list but not the second, and not appearing in local phone books post-Katrina would be tentatively classified as "potentially demised" and efforts will be made to contact their owners. These initial classifications will be added to the database.

Owners of non-recovered businesses who can be readily located from Indiana would be called to determine that they are still the owners. At the time of the initial call, we would ask these owners about the current status of the business: whether their business has changed in name, character or location, and whether it is open or closed.

A variety of search methods will be necessary to search for owners of missing businesses (Jarmin & Miranda, 2006). Since we will already have the business and owner's names, we will check public records such as bankruptcy filings, property sales and transfers, Social Security Death Index and local obituary records. The businesses of deceased owners would be classified as "closed" and excluded from further study. We will search local phone books to locate owners of remaining missing businesses and obtain a current phone number and address for them.

To locate remaining owners of "missing" businesses, we plan to take a team to Mississippi to find original locations, make inquiries, visit local building permitting offices and county records offices, and network in the communities etc. in a concerted effort to locate these business owners and determine the status of their businesses. In some cases, businesses may have moved, changed ownership, or have been renamed and would not therefore be "demised". Owners who cannot be located by phone will be targeted during the Phase I field work in Mississippi.

Phase I geo-coded business location data will be matched to the geo-coded damage assessments provided by FEMA for Hancock, Harrison and Jackson Counties (Federal Emergency Management Agency, 2005), and each business will be assigned scores for nature of damage and degree of damage. The

maps show Hurricane Katrina damage ranging from minor to catastrophic and due to a variety of causes, flood, surge, and wind. These maps will provide an objective measure of the nature and damage suffered by each business as well as by its surrounding neighbors. Graduate students participating in a GIS analysis course taught by Dr. Raymond Florax, Professor of Agricultural Economics at Purdue will participate in analyzing the GIS data. This analysis will help determine whether business survival and demise are directly associated with nature and degree of damaged suffered.

Initial variables will include: name and address of owner and business (pre- and post-disaster) 2005 business income, number of employees, industry SIC code, GIS location code, whether business is open, closed or new post-disaster. Phase I has received Human Subjects approval.

A key objective of this portion of the study is to determine an appropriate representative sampling design assessment of survival and demise and the small business recovery process in the context of family and community recovery (the second phase of this project). It is impractical to assess the story of every small business in the affected area, approximately 12,000 small businesses in total (based on the 2002 Economic Census). A carefully designed sampling strategy is an essential next step for study of small business demise or recovery from natural disaster. Subjects will then be randomly drawn from the located businesses to obtain 1400 respondents for the Phase II interviews. We anticipate that the 1400 number will decay over the course of the interviews resulting in a one year final follow-up sample of approximately 1000 business owners.

 Phase II Objectives, comprehensive interviews

1) To conduct a comprehensive study of owners of small businesses that survived a natural disaster and those that have been discontinued.

2) To gain in-depth information about the factors that contributed to survival or to demise.

 Phase II Methods

 After identifying appropriate businesses (recovered, non-recovered) from Phase I, a representative sample will be selected. The University of Wisconsin Survey Center will be sub-contracted to conduct a 30 minute telephone interview with 1400 business owners. All business owners will be asked demographic questions about their businesses as needed to obtain information beyond what is included in the initial mailing list data or to confirm it. It will be especially important to confirm business locations since some may have relocated post-disaster as part of their recovery strategy. Participants in the study will be paid a modest stipend as compensation for their participation.

The bulk of this phase of the study will be focused on the preparation, mitigation, response and recovery experience of owners, and especially on "outside" factors that influenced their decision making. We are particularly interested in family impacts, utility and infrastructure

restoration, disaster relief sources used, insurance coverage and settlements, community decisions (e.g. rezoning), availability of building contractors to make repairs, and loss of suppliers. We will also assess owner resiliency, how the owners typically adjust to change, and examine the owner's comfort with risk.

Phase II variables will not only include business experiences but also family and community variables since small businesses are closely tied to both. Owners will be asked to characterize their family pre- and post-disaster, especially to determine what family challenges may have impacted their business decisions. In a disaster situation, we expect that the majority of owners will have put family considerations first. We also expect to find a number of home-based businesses in the sample and they will have been directly impacted by what happened to the family and its residence. Examples of variables include: business demographics (pre- and post-disaster, business decisions made (pre- and post-disaster actions), disaster impacts on business and family, family demographics, family/owner resiliency (family functionality, scheduling congruity, pattern of adjustment to disruption), disaster damage (nature and degree of damage to business and family residence), owner risk position (owner's risk assessment, risk aversion, business risk partnerships such as insurance coverage, pre-disaster preparation strategies, location risk), type of disaster relief received by business and family, nature, type and duration of community infrastructure losses that impacted business reopening, and civil society measures such as owner attachment to community. We will also include owners' assessments of the disaster related factors that influenced the survival or demise of their businesses.

This data will be supplemented with business data from the initial mailing lists (e.g. 2005 income data), from FEMA damage assessment maps, and with federal and state disaster aid data included in the SHELDUS data base. SHELDUS is a county-level data set for the U.S. based on 18 different natural hazard event types along with property and crop losses, injuries, and fatalities for the period January 1960 through December 2005. The database was compiled to examine spatial and temporal variability in historical hazard events and associated losses. We will utilize the Mississippi data pertaining to Hurricane Katrina for the ten counties included in this study. Loss totals are based on SHELDUS records. As a result, loss totals are often under-reported (e.g. Hurricane Katrina) due to lack of information in the data sources from which SHELDUS data are compiled. The data on Hurricane Katrina are current as of December 2005 as reported by the National Climate Data Center (NCDC). SHELDUS relies on NCDC data and does not consider government reports (e.g. FEMA, GAO), newspaper information or any other sources to supplement NCDC's Storm Data publications. NCDC plans to update loss figures for Hurricane Katrina in the future. Once these updates become available, they will be incorporated into SHELDUS. This data will help to provide a picture of impact on the community and will be supplemented with direct questions to business owners regarding disaster funding sources they utilized as a result of Katrina (Hazards & Vulnerability Research Institute, 2007).

Phase III Objective, follow-up

1) To monitor businesses surveyed in Phase II beyond the initial interview. This will enable us to assess the process of recovery by examining changes over time in open/closed status, income and other measures of recovery.

Phase III Methods

One year after the main interviews, the owners will be re-contacted by mail to determine the current status of the business and to update information and to pursue any additional areas that may arise from the initial data collection. This phase will enable the researchers to track businesses over a period that will end approximately seven years after the initial event that occurred in August, 2005. This window will provide a sustained look at the process of recovery from disaster over a five year period and also allow us to identify and analyze businesses that initially recovered and later failed.

Data Analysis

Since all participants in this study will have been impacted by the same disaster event, survivor analysis with right sided censoring can be utilized to examine time of demise over a five year period post-disaster (Allison, 1996). We will work with Dr. Brian Craig, a survival analysis expert in the Department of Statistics at Purdue and his graduate students in designing the appropriate analyses. In addition, various regression analysis methods and other appropriate statistical analyses will be utilized to analyze the data to determine association of study variables with survival and demise.