

# Social Capital and Business Giving to Charity Following a Natural Disaster: An Empirical Assessment <sup>1</sup>

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**Abstract** This study examines the participation of local businesses in disaster relief efforts in their own communities. We utilize a unique survey of 463 businesses in Pitt County, North Carolina, collected shortly after devastating flooding caused by Hurricane Floyd. Our results indicate that managerial social capital especially through religious participation is positively related to provision of assistance to employees as well as making cash contributions and the value of cash donations. Manager ties to civic organizations positively predict in-kind donations including temporarily loaning vehicles and equipment to relief efforts. Local branches of national chains were less likely than locally-owned franchises to provide assistance to employees and less likely than independent local businesses to provide in-kind contributions. We do not find evidence that business charitable giving is affected by the number of years the business operated in the community or the number of years the owner or manager has lived in the area.

*JEL Classifications:* D21; D64; H41; M14

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## 1. Introduction

In recent years corporate social responsibility and business philanthropy have received increased public and scholarly attention. The bulk of the research seems to examine the behavior of large firms and their relations with equally prominent charities or philanthropies. This study investigates important, yet under-researched, aspects of business social responsibility and charity. What sorts of businesses are more likely to provide assistance to employees adversely affected by a natural disaster? Which are more likely to provide in-kind and financial contributions to local relief efforts in the immediate aftermath of a natural disaster? Does the extent of business or managerial social capital affect the likelihood of contributing to local disaster relief efforts? In order to address such issues, we utilize a unique dataset from a survey of 463 representative businesses in Pitt County, North Carolina, collected shortly after devastating flooding caused by Hurricane Floyd in September 1999. Hurricane Floyd directly affected over two million people and resulted in what was at the time the largest peacetime evacuation in U.S. history.

Social capital is widely conceptualized as a resource that facilitates reciprocal access to other resources (Bourdieu 1986; Coleman 1988; Putnam 2000; Lin 2002). Over the last 10 years a large theoretical and empirical literature on social capital has emerged among political scientists, sociologists, analysts of development, the non-profit sector and to a lesser extent economists.<sup>2</sup> The research presented here conceptualizes social capital as primarily a social structural variable, operationalizing it as social networks that link individuals and/or

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<sup>2</sup> One stream of research following Putnam 2000 tends to conceptualize social capital as something that inheres in individuals and ties it to the production of collective goods like a spirit of cooperation available to a community or nation at large. Applied to the case examined in this research this conceptualization of social capital might be used to explain why the locally generated disaster response in Pitt County, NC may have exceeded local response in other counties. Such questions lie beyond the scope of this research and that conceptualization of social capital has been criticized widely (See for example: Portes 1998; Foley and Edwards 1999; Lin 2002).

organizations through which resources can be accessed. The emphasis, following Bourdieu (1986), Coleman (1988) and Lin (2002), takes the analogy with financial capital seriously and sees social capital as instrumental in the flow of goods and services to individuals and groups. Social capital is best conceptualized as *networked access to resources* (Foley, Edwards and Diani 2001).

While much research using a structural approach to social capital has examined its role in the acquisition of resources by individuals or organizations, others have stressed its efficacy in promoting civic engagement and participation in collective efforts to promote the public good (Cainelli, Manucinelli, and Mazzanti 2007). The notion of reciprocity resonates throughout recent research on the efficacy of social capital. Feelings of reciprocity and a sense of reciprocal obligation arise from social interaction and prior relations and are accessed through relations in informal and institutional social networks. Thus, the presence of social capital indicated by community ties of various kinds is expected to predict the provision of disaster relief resources as well as the receipt of same.

To our knowledge there have been no studies of local business giving to more localized natural disaster relief and recovery efforts. Rather, most scholarly attention in recent years has focused on corporate philanthropy and corporate social responsibility. Much of this research and analysis, especially about corporate social responsibility, has been argumentative directed at readers of journals of opinion and not empirically based. Empirical research has emphasized philanthropic behavior among large firms toward established national charities. Analysts have examined a trend toward “strategic” philanthropy intended to improve the firm’s position and increase profitability (Mullen 1997; Baron 2001; Saiia, Carroll and Buchholtz 2003). Others have examined the impact of CEO attributes and managerial autonomy and found them to be

positively, though weakly, related to patterns of corporate giving (Lerner and Fryxell 1994; Seifert, Morris and Bartkus 2004). Whiteman et al. (2005) analyzed response to the South Asian tsunami among Fortune Global 500 firms and found that both the likelihood of donating and the value of donations were positively affected by the firm's home region, size, profitability, and degree of internationalization.

In this study, we provide empirical evidence on the role of social capital in predicting the provision of disaster relief efforts by local businesses. For empirical analysis, we use limited dependent variable models to investigate the factors that influence business participation in charitable contributions. Our results indicate that managerial social capital especially through religious participation positively predicts provision of assistance to employees as well as making cash contributions and the value of cash donations. Yet, manager ties to civic organizations positively predict in-kind donations including temporarily loaning vehicles and equipment to relief efforts. Local branches of national chains were less likely than locally-owned franchises to provide assistance to employees and less likely than independent local businesses to provide in-kind contributions to local relief and recovery efforts. Businesses that themselves received disaster assistance and those with charitable giving policies in place prior to the flood were also more likely to support local relief efforts.

## **2. Hurricane Floyd and Disaster Response**

During September 1999 a series of Atlantic storms—three hurricanes, a tropical depression and a frontal system—made landfall along the North Carolina coast and deposited between 20 and 40 inches of rain across the low-lying topography of the coastal plain (Riggs 2001). This series of storms culminated in massive flooding region-wide with sixty-six North Carolina counties

declared disaster areas including all forty-one counties of the eastern region. Estimates of the total cost of flood damages to homes, businesses, roadways, etc. exceeded six billion dollars (Federal Emergency Management Agency 2002) with the heaviest impact concentrated in the forty-one counties of the eastern region (Wilson et. al. 1999).

Pitt County is located in the coastal plain of eastern North Carolina. Pitt County (pop. 150,000) is bisected by the Tar River and was the site of some of the most severe flooding. Flooding along the Tar River inundated large portions of Greenville (pop. 75,000). For several days at the height of initial flooding all highways and roads into Greenville were closed, the airport runways were entirely submerged as were train lines. Helicopters and private boats were the only means of transportation into Greenville or across the Tar River from the city's north side to its south. Many residents whose homes or workplaces were not directly affected by the flooding found themselves either stranded at work unable to return home, or at home unable to report for work.

Local government agencies, civic groups and churches responded quickly to the flood and initiated broad-based local relief efforts before representatives of state-level or national relief organizations could get into the city. These included swift water rescues, establishing temporary shelters in public school buildings, reunification of families separated by flood water, provision of emergency food, clothing, and equipment. Over the next several months, in coordination with state and national government agencies and relief organizations, a wide array of disaster relief and recovery efforts for the county emerged in Greenville. Many individuals, non-profit organizations and local businesses contributed to local relief efforts in a number of ways.

Pitt County businesses were variously affected by the storm and subsequent flooding. About seven in ten closed for some period of time leading to financial losses while about one in

three suffered property damage. Local relief efforts took a variety of forms and local businesses participated in a number of ways. Most allowed extra flexibility in scheduling and work hours, while others allowed leave without pay or the use of accumulated vacation or sick leave. About three in ten gave paid leave, short-term loans or pay advances. One local boat manufacturer rebuilt, free of charge, the homes of approximately 30 employees whose houses had been destroyed by the flood. Local businesses also contributed to or participated in relief efforts to benefit the community in general and not simply their own employees. The vast majority made facilities, vehicles or equipment available for temporary use and about one-third temporarily reassigned employees to help in relief efforts with full pay. Others ran ads encouraging people to help out, gave flood related discounts on merchandise, or provided in-kind and cash contributions to support relief and recovery efforts.

### **3. Data**

This study utilizes data collected through a phone survey of businesses operating in Pitt County, NC at the time of Hurricane Floyd related flooding. The survey was administered by the Survey Research Lab at East Carolina University in February 2000, approximately five months after the flood. Interviews were conducted by undergraduate statistics and research methods as part of a class project. Random digit dialing procedures were used to obtain a representative sample from a listing of county businesses. After contact was made the interviewer asked to speak with the owner or manager of the business. If the owner or manager was unavailable respondents who held other positions were interviewed. A response rate of 70% yielded a sample of 500 businesses. Thirty-seven respondents were subsequently removed from the sample because they were identified as non-profit organizations, local government agencies or churches. The final

sample includes 463 businesses with a margin of error of  $\pm 4.6\%$ . All responses are self-reported with no independent verification of validity.

In this study we consider four indicators of the type and extent of local business contribution to flood relief and recovery efforts. Respondents were asked if their business had provided cash donations to relief organizations involved in flood relief and recovery. *SUPPCASH* is coded 1 if the business reported making cash contributions and zero otherwise. *SUPPKIND* is coded 1 if the business reported making in-kind contributions to support flood relief and recovery efforts and 0 if they did not. Respondents were asked if their business provided six different forms of support to employees. Provision of three forms of support to affected employees—providing paid leave from work, using accumulated sick leave or vacation time, paid leave without using accumulated sick or vacation leave, and provision of cash or in-kind gifts—required greater transaction or hard costs to the business compared to allowing leave without pay, giving pay advances or making short-term loans. *SUPPEMPL* was coded 1 if a business reported providing any one of these costlier forms of employee assistance and 0 if they did not. The joint and marginal frequency distributions of participation are compiled in table 1. The rate of participation in in-kind contributions (62.42%) and employee support (55.08%) is relatively higher than that of cash donations (43.84%). These proportions appear large although about 21% of the local businesses did not participate in any relief efforts. We also find that 3.24% of the businesses participated in only cash donations, 8.86% provided only in-kind contributions, and a larger proportion of 10.37% participated in employee support. *DOLLAR* indicates the amount of dollars each business reported contributing to flood relief efforts. Based on the 253 non-missing responses to this question, the average amount of support was \$9,844.

Our explanatory variables are divided into the following five conceptual categories:

business social capital, owner/manager's social capital, disaster assistance the business received, damage/disruption to the business, and other control variables for pertinent business attributes.

We use three indicators of business social capital. Each measure captures variations in the extent to which the business itself, not its owner or manager, is tied to the community. Respondents were asked if their business was a local branch or outlet of a regional or national chain, or a local franchise of a regional or national company, or an independent business that is not affiliated with any chain, franchise or larger corporation. We expect local outlets of national chains to have the weakest ties to the locality and be less likely to employ management with local ties. Thus, they are considered to have less local social capital than franchises which are typically locally owned and have more autonomy to decide local policy independent of policies dictated at the corporate level. Finally, independent, locally-owned business assumed to have more local social capital than either franchises or chains. About 21% of the businesses were local outlets of national chains while about 16% were local franchises. Businesses are considered to have had greater ties to the community and thus more networked means of providing or accessing resources if they were a family-owned business or had operated in Pitt County for a longer number of years. About 57% were identified as family-owned. The businesses operated in Pitt County on average about 19 years.

We use four indicators of owner/manager's social capital. Each of these measures indicates variations in the type and strength of ties each owner/manager has to the locality. Respondents were asked whether they participated regularly in local civic, business or religious groups. *CIVIC*, *CHAMB*, and *RELIG* were all coded 1 if the respondent reported regular involvement and 0 if they were not regularly involved. Almost a half of the respondents indicated regular involvement in civic groups (45%) and business association (48%), and about



65% were active in religious organizations. *YRLIVE* measures the number of years the owner/manager has lived in eastern North Carolina. The sample mean was about 29 years. Each of these measures indicates increased access to social networks and stronger ties to the locality and is expected to be positive predictors of participation in relief and recovery efforts.

We use two indicators to measure the extent to which local businesses were themselves recipients of post-flood assistance. Respondents were asked several questions designed to determine the kinds of assistance they received in the first few weeks after the flood. These included the use of a vehicle or other equipment like generators; materials needed for clean up and repair; and volunteer assistance in clean-up and repair. *ASSIST* is coded 1 if a business received any one of these forms of assistance and 0 if they received none of them (23%). *STORAGE* is coded 1 if respondent's business received usage of temporary storage and office facilities and 0 if they did not (9%).

We constructed four dichotomous indicators of the extent of flood-related damage and disruption each business suffered. Each is coded 1 if the business experienced a form of damage or disruption, and 0 if it did not. *IMPACT* indicates whether or not its employees suffered storm or flood damages (56%). *LOSS*, *CLOSE*, and *DAMAGE* refer to whether or not the business itself had losses from storm/flood related disruption (65%), whether it shut-down for any time because of the disaster (71%), and whether the business had damages to its building or equipment (32%).

*DOLLAST* measures the estimated dollar value of the businesses charitable contributions during the year before Hurricane Floyd. The mean contribution in the previous year was \$8,547. *POLICY* indicates a business with a charitable giving policy already in place at the time of the disaster. About 30% had the policy in place before the flood. *EMPLOYEE* indicates the number of employees prior to the flood. The sample mean for this variable was about 19. *SECTTRD*,

*SECTMFG*, *SECTSVCS* and *SECTOTH* are the indicators for businesses in the retail or wholesale trade (25%), manufacturing (4%), service (33%), and other (37%) sectors, respectively. Table 2 reports the summary statistics for each variable used in this research.

#### 4. Empirical Analysis

This study uses limited dependent variable models to explain the participation of local businesses in disaster relief efforts in their own community. We distinguish between the business participation in providing support to their employees and the business decision to contribute to charitable giving.<sup>3</sup> We first model the business decision to provide employee support. Suppose that the business decision is determined by an unobserved latent variable,

$$G_i^* = X_i' \beta + u_i \quad [1]$$

for business  $i$ ,  $i = 1, \dots, n$ . Only  $G_i$  is observed, which equals 1 if  $G_i^* > 0$ , implying that business  $i$  chooses to provide support to the employees who were affected by the flood;  $G_i$  equals zero otherwise. A vector  $X_i$  includes the business and managerial social capital measures, assistance received after Floyd, business damage/disruption measures, and other business characteristics, and  $u_i$  is the error term. Assuming that  $u_i$  is normally distributed, we describe the probability of business participation in employee support using the probit model:

$$\Pr(G_i = 1) = \Phi(X_i' \beta) \quad [2]$$

where  $\Phi$  is the cumulative normal distribution function.

Next we turn to model the business decision to provide cash donations to relief organizations and in-kind contributions to support relief efforts. It appears reasonable to assume

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<sup>3</sup> Joint estimation of these decisions within a multivariate probit regression showed that the correlation coefficients of the error terms were insignificant suggesting the separate estimations.

that information about participation in one charitable giving helps the prediction of the participation probability of the same business for another charitable contribution. If the participation in cash donations is at least partially correlated with the participation in in-kind contributions, a suitable framework for modeling is necessary. The appropriate specification for this type of model is the bivariate probit, a statistical framework in which error terms of the two equations are correlated. In this paper, we model the business participations in cash and in-kind donations as a bivariate probit model, assuming that the unobservable error terms are normally distributed. Suppose that  $G_{i1}$  equals 1 if  $G_{i1}^* > 0$ , implying that business  $i$  chooses to provide cash contributions;  $G_{i1}$  equals zero otherwise given a set of business characteristics  $\mathbf{X}_{i1}$ , and other unobserved characteristics  $u_{i1}$ . Similarly, let  $G_{i2}$  equal 1 if  $G_{i2}^* > 0$ , implying that business  $i$  chooses to provide in-kind donations;  $G_{i2}$  equals zero otherwise. Then, the bivariate probit model is given by

$$\begin{aligned} G_{i1}^* &= \mathbf{X}'_{i1}\boldsymbol{\beta}_1 + u_{i1} \\ G_{i2}^* &= \mathbf{X}'_{i2}\boldsymbol{\beta}_2 + u_{i2} \end{aligned} \tag{3}$$

The random error terms,  $u_{i1}$  and  $u_{i2}$ , are dependent and normally distributed, such that  $E[u_{i1}] = E[u_{i2}] = 0$ ,  $\text{var}[u_{i1}] = \text{var}[u_{i2}] = 1$  and  $\text{cov}[u_{i1}, u_{i2}] = \rho$ . The bivariate probit specification with potentially non-zero off-diagonal elements in the variance-covariance matrix of the error terms allows correlation across the error terms of the two latent equations, which embody unobserved characteristics for the same businesses. The two equations can be estimated separately as binomial probits if  $\rho$  is insignificant. The bivariate joint probabilities are given by:

$$\begin{aligned} \Pr(G_{i1} = 1, G_{i2} = 1 | X_{i1}, X_{i2}) &= \Phi_2(\mathbf{X}'_{i1}\boldsymbol{\beta}_1, \mathbf{X}'_{i2}\boldsymbol{\beta}_2, \rho) \\ \Pr(G_{i1} = 1, G_{i2} = 0 | X_{i1}, X_{i2}) &= \Phi_2(\mathbf{X}'_{i1}\boldsymbol{\beta}_1, -\mathbf{X}'_{i2}\boldsymbol{\beta}_2, -\rho) \\ \Pr(G_{i1} = 0, G_{i2} = 0 | X_{i1}, X_{i2}) &= \Phi_2(-\mathbf{X}'_{i1}\boldsymbol{\beta}_1, -\mathbf{X}'_{i2}\boldsymbol{\beta}_2, \rho) \end{aligned} \tag{4}$$

where  $\Phi_2$  denotes the cumulative distribution function of standard bivariate normal distribution. The univariate and bivariate probit models are estimated by maximizing the log-likelihood functions.

Finally we analyze the business decision on the total dollar amount of support for flood relief and recovery efforts. While only a 55% of the survey respondents answered to this question, a large proportion of the answers (13%) indicated that they did not provide any support. Given the large number of zero values of the dependent variable, a tobit analysis was used to examine the unique contribution of each independent variable to the total amount donated by businesses while controlling for the effects of other independent variables in the model. The tobit model is given by

$$\begin{aligned} G_i^* &= \mathbf{X}_i' \boldsymbol{\beta} + u_i \quad \text{where } G_i = G_i^* \quad \text{if } G_i^* > 0 \\ G_i &= 0 \quad \text{if } G_i^* \leq 0 \end{aligned} \quad [5]$$

where  $u_i$  is a normally distributed error term. The tobit model uses a likelihood function that combines a standard linear model with normal error distribution and a probit model for the censored data. Since the parameters in the limited dependent models described above are not necessarily the marginal effects, like those of any nonlinear regression model, we report the marginal effects of the independent variables as well (Greene 2003).

## 5. Estimation Results

Table 3 reports estimates from the probit regression for the probability of providing support to the employees affected by the flood. The specification includes business social capital measures, owner/manager's social capital measures, whether the business had received assistance related to the flood, business damage/interruption measures, and other business characteristics. Results

indicate that the local franchises of a regional or national company are more likely to provide assistance to their employees than the independent local businesses not affiliated. The marginal effect implies that a local franchise has a 0.168 higher probability than an independent local business. A family owned business has a 0.163 lower probability to provide the employee assistance, all else equal. As expected, businesses with an owner/manager who is active in civic groups or religious organizations are more likely to provide the employee support. The businesses with employees who suffered from storm or flood damage have a 0.476 higher probability of providing support to the employees, all else equal. Businesses that shutdown at any time after the disaster appears to have a higher probability of providing employee support. The coefficient estimates on the total charitable contribution made last year and policies covering charity are positive and statistically significant. Service-sector businesses were less likely to provide support to the employees, all else equal.

In table 4, we provide the results for the bivariate probit estimation of cash and in-kind contributions. The estimated correlation of the error term ( $\rho$ ) was positive and is significantly different from zero. The results confirm that the cash and in-kind business contributions are jointly determined, and that a bivariate probit model is indeed an appropriate estimation approach rather than estimating two separate univariate probit models. The results show quite different patterns of the effect of social capital measures on the business participation decision. Family-owned businesses and the businesses with the owners actively involved in religious organizations are more likely to participate in cash contributions. However, businesses with the owners actively involved in civic group activities are more likely to participate in in-kind donations. A local branch or outlet of a regional or national chain is less likely to participate in in-kind donations. Marginal effects imply that a firm with the employees suffered from storm or

flood damage has a 0.109 higher probability to provide in-kind donation given that the firm also makes the cash donations. Other business characteristics seem to affect the business charitable contribution decision somewhat uniformly. Higher total charitable contributions made last year are associated with the higher probabilities to make both cash and in-kind contributions. Businesses with the policies covering contributions to charitable activities have a 0.133 higher probability to make cash contributions given that the firm participates into in-kind donations.

Finally, table 5 reports the results from the tobit regression. Results indicate that businesses with the owners actively involved in religious organizations are likely to support for local flood relief and recovery effort about a \$5,078 more. The coefficients for the variables related to the assistance received after Floyd are positive and significant. Assistance received immediately after Floyd is associated with a \$3,668 higher total support while temporary storage or facilities is related to a \$4,792 higher total support. Businesses with the employees suffered from storm or flood damage are more likely donate a larger amount. As expected, higher total charitable contributions made last year are associated with higher total contribution made the current year.

## **6. Discussion**

This study utilizes the unique survey data on local businesses in Pitt County, North Carolina, collected shortly after hurricane Floyd related flood to examine the relationship between a business social capital and participation in local disaster relief and recovery. We investigate factors that influence the business participation in charitable contributions. While limited studies focused on corporate philanthropy and corporate social responsibility on a relatively large scale, to our knowledge there have been no studies of local business giving to more localized natural

disaster relief and recovery efforts. Our results provide valuable empirical information on local business philanthropy.

We conceptualize social capital as a structural resource through which individuals and groups access other resources. We consider indicators of both business social capital and that of the local manager/owner. Our findings indicate that business participation in local disaster relief and recovery is positively related to the business and owner/manager's social capital. Businesses with owners who are active in civic organizations are more likely to provide in-kind donations to local relief efforts. Moreover, businesses whose owners or managers are actively involved in religious organizations are more likely to provide cash donations to aid disaster relief. We attribute this to two factors. First, business people who regularly participate in civic organizations or attend religious services are embedded in social networks that will make them more likely to be approached to provide assistance than their counterparts who lack such ties. Second, religious congregations routinely solicit cash contributions from members and often take up special collections to meet unexpected needs of congregation members. This was the case in Pitt County in the aftermath of Hurricane Floyd and we speculate that business owners or managers who regularly attended religious services would have been solicited for cash donations repeatedly during the months following the flood. All else being equal repeated solicitation will increase the probability of donating.

During the natural disaster, a locally owned franchise of a regional or national company is more likely to provide employee support than a local branch of national chains or an unaffiliated local business. We find no evidence that business charitable giving is related to the number of years the business operated in Pitt County or the number of years the owner or manager has lived in area which we conceived as indicators of stronger communal ties or social

capital. We also find evidence of reciprocity in post-disaster resource exchanges in that businesses that received disaster recovery assistance made more valuable donations to relief efforts themselves. Not surprisingly, the size of past charitable contributions is a good indicator in predicting the size of the future contributions.

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**Table 1**  
**Joint and Marginal Participation Probabilities for Businesses Charitable Contributions**

	Joint Probability	Marginal (Cash)	Marginal (In-kind)	Marginal (Empl. supp.)
None	20.73			
Cash contribution only	3.24	3.24		
In-kind contribution only	8.86		8.86	
Employee support only	10.37			10.37
Cash and in-kind contribution	12.10	12.10	12.10	
Cash and employee support	3.24	3.24		3.24
In-kind and employee support	16.20		16.20	16.20
Cash, in-kind, and employee support	25.27	25.27	25.27	25.27
<b>Total</b>	<b>100.00</b>	<b>43.84</b>	<b>62.42</b>	<b>55.08</b>

Note: Probabilities are measured as percentages of total respondents.

**Table 2**  
Variable Definitions and Summary Statistics for Business Charitable Contribution

Variable	Description	Mean	Std. Dev.
<u>Business Charitable Behaviors</u>			
SUPPEMPL	Provided support to the employees affected by the flood (=1)	0.55	0.50
SUPPCASH	Provided cash donations to relief organizations (=1)	0.44	0.50
SUPPKIND	Provided "in-kind" contributions to support relief efforts (=1)	0.62	0.48
DOLLAR	Total amount of support for flood relief and recovery efforts	9844.27	35364.46
<u>Business Social Capital Measures</u>			
CHAIN	Local branch or outlet of a regional or national chain (=1)	0.21	0.41
FRANCHS	Local franchise of a regional or national company (=1)	0.16	0.37
LOCAL	Independent local business not affiliated (=1)	0.63	0.48
FAMILY	Family-owned business (=1)	0.57	0.50
PITT	Number of years the business operated in Pitt County	19.03	18.15
<u>Owner/Manager's Social Capital Measures</u>			
CIVIC	Activity in civic groups (=1)	0.45	0.50
CHAMB	Activity in business associations (=1)	0.48	0.50
RELIG	Activity in religious organizations (=1)	0.65	0.48
YRLIVE	Number of years the owner/manager lived in eastern NC	28.86	17.58
<u>Assistance Received</u>			
ASSIST	Assistance received immediately after Floyd (=1)	0.23	0.42
STORAGE	Temporary storage or facilities received after Floyd (=1)	0.09	0.28
<u>Damage/Disruption Measures</u>			
IMPACT	Employees suffered from storm or flood damage (=1)	0.56	0.50
LOSS	Losses due to the disruption of the business (=1)	0.65	0.48
CLOSE	Business shut down for any time after the disaster	0.71	0.45
DAMAGE	Damages to the building or equipment from Floyd (=1)	0.32	0.47
<u>Other Control Variables</u>			
DOLLAST	Total charitable contributions made last year	8547.97	24362.33
POLICY	Policies covering contributions to charitable activities (=1)	0.30	0.46
EMPLOYEE	Number of employees working this location before Floyd	18.67	35.21
SECTTRD	Industry sector for retail or wholesale trade (=1)	0.25	0.44
SECTMFG	Industry sector for manufacturing (=1)	0.04	0.20
SECTSVC	Industry sector for service (=1)	0.33	0.47
SECTOTH	Industry sector for others (=1)	0.37	0.48

Notes: Number of observations is 463. Total amount of support for flood relief and recovery efforts is based on the 253 responses.

**Table 3**  
**Probit Estimation for Employee Supports by Businesses**

	SUPPEMPL			
	Coeff.	Std. Err.	Marg. Eff	Std. Err.
CHAIN	0.297	0.190	0.114	0.070
FRANCHS	**0.451	0.209	**0.168	0.073
FAMILY	**-0.423	0.150	**-0.163	0.057
PITT	0.007	0.004	0.003	0.002
CIVIC	**0.401	0.163	**0.155	0.062
CHAMB	0.077	0.157	0.030	0.061
RELIG	*0.277	0.158	*0.109	0.062
YRLIVE	3.1e-04	0.005	0.000	0.002
ASSIST	-0.155	0.175	-0.061	0.069
STORAGE	0.414	0.284	0.153	0.097
IMPACT	**1.284	0.148	**0.476	0.048
LOSS	0.217	0.171	0.085	0.067
CLOSE	**0.432	0.175	**0.170	0.069
DAMAGE	-0.129	0.163	-0.051	0.064
DOLLAST	*9.5e-06	5.6E-06	*3.7e-06	2.2e-06
POLICY	*0.304	0.162	*0.117	0.061
EMPLOYEE	3.9e-06	3.9e-04	1.5e-06	1.5e-04
SECTTRD	0.041	0.188	0.016	0.073
SECTMFG	0.534	0.387	0.192	0.122
SECTSVC	**-0.364	0.169	**-0.143	0.066
CONSTANT	**-1.411	0.254	**-0.552	0.101
Log likelihood	-220.272			

Notes: Number of observations is 463. \* indicates significance at 10% level. \*\* indicates significance at 5% level. Marginal effects of the dummy variables are computed using  $E[G|d=1] - E[G|d=0]$  where d is the dummy variable. Otherwise, marginal effects are evaluated at those observed means.

**Table 4**  
Bivariate Probit Estimation for Cash and In-kind Contributions by Businesses

	SUPPCASH				SUPPKIND			
	Coeff.	Std. Err.	Marg. Eff	Std. Err.	Coeff.	Std. Err.	Marg. Eff	Std. Err.
CHAIN	-0.252	0.185	-0.029	0.079	** -0.595	0.180	** -0.131	0.051
FRANCHS	0.065	0.197	0.036	0.080	-0.055	0.217	-0.022	0.055
FAMILY	**0.361	0.139	**0.148	0.059	0.063	0.145	-0.023	0.038
PITT	0.002	0.004	0.000	0.002	0.005	0.005	0.001	0.001
CIVIC	-0.062	0.146	-0.085	0.062	**0.426	0.153	**0.121	0.041
CHAMB	0.160	0.146	0.056	0.060	0.099	0.159	0.009	0.040
RELIG	**0.575	0.159	**0.230	0.066	0.150	0.150	-0.023	0.039
YRLIVE	-0.002	0.004	-0.002	0.002	0.004	0.004	0.001	0.001
ASSIST	**0.463	0.163	**0.175	0.064	0.193	0.184	0.001	0.046
STORAGE	0.116	0.238	-0.025	0.099	*0.562	0.334	0.138	0.084
IMPACT	0.151	0.146	0.002	0.060	**0.469	0.147	**0.109	0.040
LOSS	-0.120	0.171	-0.050	0.071	-0.017	0.166	0.009	0.043
CLOSE	0.036	0.166	-0.016	0.070	0.236	0.181	0.059	0.049
DAMAGE	0.206	0.152	0.064	0.065	0.188	0.162	0.028	0.042
DOLLAST	**1.2e-05	4.5e-06	*3.2e-06	1.8e-06	**1.4e-05	5.5e-06	*2.4e-06	1.4e-06
POLICY	**0.434	0.148	**0.133	0.061	**0.414	0.175	0.063	0.045
EMPLOYEE	*0.001	0.001	*3.5e-04	1.9e-04	2.6e-04	4.2e-04	-2.7e-05	8.7e-05
SECTTRD	0.228	0.177	0.100	0.074	-0.002	0.181	-0.026	0.047
SECTMFG	-0.090	0.304	-0.011	0.126	-0.206	0.361	-0.045	0.092
SECTSVC	0.033	0.162	0.010	0.067	0.031	0.179	0.005	0.045
CONSTANT	** -1.209	0.254			** -0.825	0.240		
Rho ( $\rho$ )	**0.559	0.070						
Log likelihood	-501.878							

Notes: Number of observations is 463. \* indicates significance at 10% level. \*\* indicates significance at 5% level. Marginal effects of the dummy variables are computed using  $E[G_1|G_2=1,d=1] - E[G_1|G_2=1,d=0]$  where d is the dummy variable. Otherwise, marginal effects are evaluated at those observed means.

**Table 5**  
Tobit Estimation for Businesses Charitable Contributions

	DOLLAR			
	Coeff.	Std. Err.	Marg. Eff	Std. Err.
CHAIN	-5596.996	5739.929	-1854.175	1900.187
FRANCHS	-2028.531	6103.335	-672.012	2021.491
FAMILY	4399.791	4522.793	1457.564	1494.610
PITT	161.912	118.062	53.638	39.140
CIVIC	7084.995	4603.926	2347.120	1525.250
CHAMB	-2969.718	4592.725	-983.809	1523.017
RELIG	**15328.930	4930.507	**5078.173	1627.880
YRLIVE	-23.546	135.211	-7.800	44.800
ASSIST	**11071.523	4949.380	**3667.778	1644.541
STORAGE	**14466.226	7243.898	**4792.376	2412.643
IMPACT	**8640.230	4549.465	*2862.338	1505.508
LOSS	3442.459	5294.199	1140.419	1752.214
CLOSE	4397.460	5277.127	1456.792	1745.856
DAMAGE	3308.338	4651.561	1095.987	1543.889
DOLLAST	**0.433	0.089	**0.143	0.030
POLICY	2892.170	4785.237	958.119	1583.642
EMPLOYEE	20.706	13.770	6.859	4.552
SECTTRD	990.070	5341.088	327.991	1769.252
SECTMFG	5798.227	10106.432	1920.839	3347.103
SECTSVC	-4180.766	5059.549	-1385.006	1677.435
CONSTANT	**-48681.588	8222.518	**-16127.253	2460.287
Sigma ( $\sigma$ )	**36996.066	1799.681		
Log likelihood	-2736.356			

Notes: Number of observations is 253. The dependent variable is DOLLAR. Marginal effects are evaluated at those observed means.