**Creating in the Crucibles of Nature's Fury: Associational Diversity and Local Social
Entrepreneurship after Natural Disasters in California, 1991–2010**

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Abstract

This paper examines foundings of human services organizations after natural disasters such as floods, earthquakes, wildfires, hurricanes, and tsunamis and explains why only some communities bounce back by founding appropriate collective-goods organizations. Using natural disasters in California counties from 1990 to 2010 as shocks that exogenously impose a need for collective goods over and above the level endogenous to the community, this paper shows that a geographic community's local organizing capacity rests on the richness of its repertoire of voluntary organizing models as reflected in the diversity of its voluntary associations. Such diversity is even more critical when the type of natural disaster is more unexpected or complex (e.g., both a wildfire and an earthquake) in an area, and the organizational challenges posed are thus more novel for the community. Associational diversity has positive effects on both the numbers and aggregate size of foundings of local (non-branch, secular) human services organizations, and the effects are generalizable to other endogenous demand conditions such as poverty. Results also show how different kinds of variety can have opposing effects on organizing capacity as observed after a disaster, with associational diversity having a positive effect, political diversity having a negative effect, and racial diversity having no significant effect, net of other factors. The paper concludes with a call for treating community resilience as a matter of enhancing local organizing capacity over centralized planning efforts when the environment is rapidly changing.

Keywords: social capital, entrepreneurship, organizational forms, social movements, non-profits, natural disasters, social entrepreneurship, associational diversity, community resilience, organizations and the natural environment, disaster management

Communities face an array of shared challenges, which include reducing crime, maintaining clean air and water, taking care of the underprivileged and infirm, and collectively bargaining for rights and community development. Though the state offers some assistance in varying amounts, and some firms and individuals engage in philanthropic works, many these collective-goods problems need to be solved by the community itself. This can take the form of protests and lobbying to demand such goods from external agents, such as the welfare state and corporations. It can also take the form of local social entrepreneurship—pooling voluntary resources (time and money) to organize to provide collective goods in the community—such as by founding homeless shelters, soup kitchens, voluntary fire departments, local youth groups, and other such locally organized nonprofit human services organizations.

The founding of such local organizations in geographic communities is fostered not just by emergent shared problems but also by the awareness that these problems can be solved by conjoint action and the presence of organizing skills and frameworks that allow community members to contribute locally in solving such shared problems (Coleman, 1971; Sampson, 2012). Some suggest that the ability to create organizations that can reproduce such activities over the long term is a form of cultural competence for communities (Clemens, 1996: 211; Sampson et al., 2005; Greve and Rao, 2012). The existing literature has addressed the question of why some communities appear to have more of such competence from varying perspectives, such as through the lens of civic engagement (Putnam, 2000; Skocpol, 2003) and community embeddedness of social entrepreneurship (Seelos et al., 2011). There are, however, two major limitations in the existing research record.

First, prospective locally focused social entrepreneurs face not only a consensus-aggregation problem but also an organizational problem. The consensus-aggregation problem is the difficulty

of getting members of the community to agree on the kinds of social goods that should be provided from a long list of needs, absent a dictator (Arrow, 1963). The 'organizational problem' is the difficulty of gathering the right set of skills and resources that can be brought to bear on some new unsolved problem (Coleman, 1971), which is constrained by the social system in which actors are embedded (Stinchcombe, 1968, 2005). A large literature in sociology, economics, and political science discusses how the problem of aggregating preferences is compounded by demographic and ideological diversity in the community (Putnam, 2000; Costa and Kahn, 2003; Rao, Yue, and Ingram, 2010; Galaskiewicz, Mayorova, and Duckles, 2013). But relatively little attention has been paid to the organizational problem underpinning the emergence of local social entrepreneurship.

An existing line of inquiry in social entrepreneurship has focused on strong embeddedness as a driving force that helps prospective local social entrepreneurs gather resources, be fluent in local rules of the game, build trust, and recruit motivated people into their ventures (Seelos et al., 2011). Although embeddedness is certainly beneficial in making the organization a great fit for the local environment, it can also hinder responses to new problems or constraints that emerge as the environment changes. This paper argues that in changing environments the organizational (rather than consensus-aggregation) problem may best be solved by communities having a diverse voluntary sector, which provides a wide range of organizing skills, organizational routines, and resources that can be brought to bear on emergent collective-goods problems.

Second, empirically identifying the drivers of local social entrepreneurship in communities is difficult due to the co-movement of supply and demand. Solutions to problems emerge when there is a confluence of both problems and entrepreneurial groups or individuals willing and able to solve them. Because the founding of collective-goods organizations in communities is

simultaneously endogenous to both the problems in the community (demand) and the emergence of solutions (supply), it is hard to identify whether social entrepreneurship in the community is the result of demand or supply conditions. In the absence of experimental manipulation, one solution is to use an exogenous shock that creates demand for additional collective goods above the level endogenous to a particular time and place. One such shock is a natural disaster.

Adverse natural events, such as floods, earthquakes, wildfires, hurricanes, and tsunamis, and the humanitarian crises they spawn deserve attention not only as empirical shocks but also as substantive events in their own right, which place great stresses and disruptions on geographic communities. The Norwegian Research Council reported in 2015 that worldwide natural disasters displaced 19.3 million people. Such events are becoming more intense and frequent, triggering crises of displacement and damage that are felt far beyond the borders of the affected regions in an increasingly interconnected, globalized world (e.g., Fuller, 2011). Existing work in other areas has looked at the organization–natural environment interface through the lens of how managers in firms respond to demands for sustainability from multiple audiences (Starik and Marcus, 2000; Marquis and Qian, 2013) or how the rules and regulations surrounding sustainability come to be contested and negotiated (Hoffman and Ventresca, 2002). Other work has explored how natural disasters provide opportunities for locally situated changes in fields (Tilscik and Marquis, 2013) and human communities (Kirk, 2009). What has been unexplored, however, is why some communities are able to respond to these shocks proactively.

Demographic trends, the increasing pace of climate change, and financial crises have compounded the mass of vulnerable geographic communities (Tompkins and Adger, 2004; van Aalst, 2006; McQuaid and Schleifstein, 2009), while the gradual retrenchment of government services and funding, and the frequent mishandling of such crises by local administrations, have

necessitated that local communities get better at solving their own problems (Arend, 2007; Solnit, 2009; Knowles, 2012; also see Miles, 2014; Chang, 2015; *New York Times*, 2015). What features enable geographic communities to respond to such jolts in the natural environment is therefore a burning question that deserves theoretical and empirical attention.

I study the founding rate of local non-branch, non-religious human service organizations (with annual receipts of \$5,000 and above) as a measure of local social entrepreneurship for all counties in California during the period 1991 to 2010. Natural disasters, which heighten the need for particular kinds of collective goods and are determined by geological and climatic events, provide an exogenous demand shock for nonprofit human services provision. Yet only some communities respond by founding new social welfare organizations after disasters. While helping explain the roots of such resilience, communities hit by natural disasters are also strategic research sites (Merton, 1987; Stinchcombe, 2005) for understanding how preexisting community conditions influence the emergence of local social entrepreneurship when the need arises.

Associational Diversity and Local Social Entrepreneurship

The Local Civic Sphere

Putnam (2000) reenergized the debate on whether the nation of joiners that Tocqueville (1899) found in nineteenth-century America has become a nation disengaged from the civic sphere. Using the evocative imagery of “bowling alone,” Putnam argued that social interaction in communities across America is in decline, and consequently people are participating less in the civic and political sphere, such as in recreational clubs, voluntary associations, parent–teacher groups, and service clubs. Skocpol (2003) similarly lamented how membership and active

participation in voluntary associations is declining and impairing the health of American democracy. Other accounts suggest that instead of using traditional modes of voluntary association people are participating through other organized forms in civic life, so in the aggregate what has changed are the forms of participation rather than civic participation itself (Wuthnow, 1998; Sampson et al., 2005; Walker, McCarthy, and Baumgartner, 2011). Both kinds of accounts, however, are based on an underlying argument that what is important for community outcomes is the stock, or mass, of civic participation, whether deep or project-based.

Yet, as Fischer (2005) pointed out, all forms of association are not created equal; they vary in modes of organizing and participation, the resultant capacities they provide communities, and the kinds of collective goods they advocate for (see also Stolle and Rochon, 1998; Strolovitch, 2007). Furthermore, joining ongoing collective action is quite different than founding new organizations that provide collective goods. The latter requires traversing the entrepreneurial trajectory of identifying solutions, mobilizing resources, and incorporation (Ruef, 2005, 2010). It is constrained by the set of feasible founding coalitions—the availability of the right combinations of people, skills, power, and resources—which is a property of the local community (Stinchcombe, 1968: ch. 4).

Many authors have argued that entrepreneurial action owes its genesis to the social group, such as the community, family, and friends (Timmons, 1975; Ruef, Aldrich, and Carter, 2003; Ruef, 2010). The local community matters for entrepreneurship not merely as a social setting within which people act but as a source of information, opportunities, resources, and models for organizing and incorporation (Zahra et al., 2009; Ruef, 2010; Marquis, Davis, and Glynn, 2013).

Jill Staton Bullard, a part-time preschool teacher in Raleigh, NC, co-founded the Interfaith Food Shuttle after seeing how a local fast food restaurant sold her a sandwich at 10:29 and at

10:30 threw the rest of the perfectly fine sandwiches in the trash. She began the organization—which collected unused food from restaurants, events, and cafeterias and distributed it to soup kitchens and hot meal programs—with Maxine Solomon, an acquaintance from the local kids' amateur soccer league whose son played on the same team as Jill's (Poppendieck, 1998: 107). Two days after observing the food being thrown away Jill and Maxine returned to the same restaurant for unused food and distributed it at a soup kitchen in downtown Raleigh. Finding the experience life-changing, they incorporated as a local nonprofit three days later (Silcox-Jarrett, 2008).

Behind the swift emergence of a volunteer founding group, however, lay a social infrastructure that provided the resources, spaces, and organizational skills that made such a voluntary organizing effort possible and sustainable. Apart from being a teacher and a regular at kids' soccer leagues, Jill was also an active member of the local Episcopal Church. She and Maxine got legal help from a law students' group to deal with North Carolina's personal liability laws for food donors. A local seniors' community was willing to help provide spare food and became one of the earliest sources of unserved food for the organization. The organization's first volunteer, Emily Siegel, a local health practitioner, got her husband to join, who in turn brought his coworkers from BurroughsWellcome to volunteer. The Food Shuttle further collaborated with Boys and Girls Clubs in Raleigh and neighboring places for nutrition classes. Instead of depending on resources and expertise from any single institution or association, Jill and Maxine had available to them a variety of avenues for legal advice, organizing skills, non-redundant resources, and volunteering experience, leading Jill to note that "many saints have walked through this organization's doors" (Silcox-Jarrett, 2008: 114).

Community Embeddedness and Diversity

The question of what community features foster local social entrepreneurship has been approached from two fairly distinct perspectives. Commentaries and case studies on social entrepreneurship have focused on the factors and antecedents that bring altruistic individuals and groups together with needy causes and underutilized resources (e.g., Henton, Melville, and Walesh, 1997; Mair and Marti, 2006; Martin and Osberg, 2007). The embeddedness perspective in social entrepreneurship treats local communities—“individuals living in a geographic [area] and sharing some part of their identity, expectations, and interests” (Seelos et al., 2011: 2)—as opportunity spaces for social entrepreneurship. For example, the community in which individuals are embedded provides information and resources but also supplies cognitive frames for interpreting information, normative constraints such as prescriptions and obligations of social life, and institutional constraints such as formal rules, regulations, and incentive structures for particular kinds of economic or social goods provision (Marquis and Battilana, 2009; also see Scott, 2013: ch. 3). The social groups in which prospective entrepreneurs are embedded are therefore important sources of variation in their ability to identify opportunities to found new organizations and to mobilize the appropriate people and resources to take advantage of these opportunities. Though homogeneity of cognitive frames, normative boundaries, and forms of organizing social and economic interaction is likely to foster trust, reduce transaction costs, and minimize disagreement, it can also increase the redundancy of information and enhance vulnerability to exogenous changes in the environment (e.g., Uzzi, 1997). Heterogeneity can often provide non-redundant information and (at least locally) novel routines and forms of solving problems.

The corresponding debate in the sociological and public policy literature has largely centered on heterogeneity in the ascriptive characteristics of communities. Thus Putnam (2007) surmised

that diverse communities have worse outcomes, exemplified in lower voluntarism, lower civic sentiment, and generally lower health and economic outcomes. Rao, Yue, and Ingram (2010) found that racially diverse communities were less likely to protest the setup of Walmart chain stores: the lowered solidarity in racially diverse communities made it harder to act collectively. Costa and Kahn (2003) similarly suggested that diverse communities have lower growth rates because they find it harder to get things done. Even among social movement activists, who are clearly committed to the movement, diverse coalitions are harder to make work because they give rise to disagreements over the movement's goals and framing (Benford, 1993). These accounts echo those of Douglas (1992: 9–10) that diverse communities are less likely to agree on the kinds of collective goods that matter to them and therefore are less likely to mobilize over single causes. Disagreements emerge over what things the community should care about, what kinds of dangers are incident to the community, and who will benefit from collective action. All these accounts deal with the diversity of identity, which provides conflicting interests, ideologies, and worldviews and leads more often to conflict and delayed collective action than to better collective outcomes. But this literature doesn't consider the organizational problem, such as access to the appropriate models and scripts for organizing.

When the particular features of an organizational problem are unknown beforehand and the solution process is complex (such as organizing resources on a shoestring budget while trying to have maximal impact) or fraught with environmental uncertainty, the availability of multiple organizing models, solution templates, and resource arrangements becomes crucial. Page (2011) suggested that when problems are unstructured and complex, they are solved best when simultaneously approached from diverse solution paths. Similar insights come from the research on rugged competitive landscapes for firms; finding optimal solutions is more likely when search

proceeds from multiple and more distant points in the solution landscape because it allows for the discovery of solutions that are better than the closest local solutions. Similar examples can be found in meso-level accounts of organizing resources for shared benefit, such as in the trading floors of a Manhattan bank (Beunza and Stark, 2003), or in macro-level case studies of how the presence of a diverse set of institutional arrangements for governance and resource sharing allows for more resilient common-pool resource environments (Dietz, Ostrom, and Stern, 2003).

Communities with a diverse set of voluntary organizing models have a wider array of organizational raw materials—organizing skills, organizational routines, resources, experience, and even physical spaces—for the emergence of local civic solutions to novel problems when they arise. In most studies of entrepreneurship, however, the assumption that the opportunities (or problems) themselves are exogenously imposed is often unjustified (cf. reviews by Acs et al., 2009; Alvarez and Barney, 2010). Instead, opportunities are assumed to be exogenous even when they are not, and studies proceed to analyze the varying supply-side responses based on individual attributes, social group membership, and social ties of various kinds. A more rigorous study of the determinants of local social entrepreneurship is possible by studying the effect of a true exogenous demand shock: a natural disaster. The material destruction wreaked by a natural disaster typically exceeds individuals' or families' capacity for reconstruction, and it imposes an opportunity for the provision of additional collective goods over and above the level endogenous to a geographic community.

Natural Disasters as External Shocks

Natural disasters are temporally exogenous shocks to the community's resources and relationships. As resource shocks they involve damage to public services, utilities, roads, and bridges, as well as private property such as homes and businesses. As traumatic incidents, they

have lasting physiological, psychological, and social impacts on the communities they affect. For example, the 1989 Loma Prieta earthquake in northern California caused more than 60 deaths and 4,000 reported injuries, as well as more than \$11 billion (2012) in property damage to homes, businesses, and public works such as the collapsed Embarcadero Freeway (U.S. Geological Survey, 1998). Fungi released from beneath the soil caused fever among residents of a community close to the epicenter after the Northridge earthquake in 1994 (Ayres, 1994). The thousand-year flood in the Mississippi River system in 2008, apart from leaving thousands displaced and homeless, triggered widespread mental health issues and fractured communities (Lyons, 2010). Coastal storms triggered by El Niño oscillations in 1998 set off mudslides and opened up sinkholes; homes slipped off their foundations or crashed into the ocean with chunks of coastal land (Starr, 2004: 65–66). Neighborhoods in New Orleans affected by Hurricane Katrina in 2005 continue to bear the scars of the disaster in damaged homes, fractured communities, and a weakened economy (Antoine, 2008).

In the aftermath of disaster, nonprofit human service organizations play an important role in restoring communities to a state of normalcy faster than an overstretched state or an undercompensated market alone can (Phillips, 2009: 369–490). But donations from individuals and corporate philanthropy fluctuate based on the size of the disaster event (Tilscik and Marquis, 2013). Government aid from the Federal Emergency Management Agency (FEMA) through presidential appropriations fluctuates based on economic conditions and demands for aid in other places (Platt, 1999; Lyons, 2010: 45–46). Even the capacity and responsiveness of large charitable aid agencies such as the Red Cross and United Way are constrained by disruptions in supply chains, political wrangles, lack of coordination, and lack of local knowledge (U.S. Government Accountability Office, 2008; Solnit, 2009: ch. 5). The magnitude of external

assistance is not highly correlated with the magnitude of the disaster; other factors that influence it include the news cycle and media attention (Rovai and Rodrigue, 1998; Tilscik and Marquis, 2013), kinks and complications in due process (e.g., Holder, 2007), and political considerations (Downton and Pielke, 2001; Garrett and Sobel, 2003; Reeves, 2011). Overall, the supply of external help from large charities, aid agencies, corporations, and the government is never enough to fully meet the humanitarian needs of a community reeling from disaster, especially after the media spotlight subsides; a lot of external help dries up well before the community has recovered (Lyons, 2010; Knowles, 2012). Also, government-driven top-down programs rarely reach the most vulnerable (Maskrey, 1989; Reed, 2008), and most external aid flows to large nonprofits. For example, 60 percent of the external aid pledged in the aftermath of Hurricane Katrina went to the American Red Cross alone (Strom, 2006), even though its lack of local knowledge or ties to civic networks in the worst-affected neighborhoods impeded its recovery operations (Solnit, 2009: ch. 5). Local organizing efforts are always needed.

Utopian visions of the aftermath of disaster variously describe a “silver lining” or a “blank slate”—an occasion to come together eschewing boundaries of social and economic class and rebuild the physical environment to something better than it was before (James, 1911; Brooks, 2005; Solnit, 2009; Turner, 2012). The stark reality for most community members, however, is one of destruction and deprivation, perhaps while being victimized even further by distrustful state machinery, negligent government contractors, and corrupt city officials (Tierney, Bevc, and Kuligowski, 2006; Klein, 2007; Reed, 2008; Robertson, 2013). Several scholars have called for a semantic switch, framing disaster as not the natural event itself but the spiral of humanitarian crises that unfolds afterward; the poor and underserved sections of the community end up being the most affected, as their employment is disrupted and the public services they rely on are

dysfunctional or damaged (Erikson, 1976; Wisner et al., 2004; Tierney, 2006; Perry, 2007).

Post-disaster foundings of local human services organizations. Disasters are destructive yet can also provide an impetus for new and essential organizations to emerge (e.g., Paruchuri and Ingram, 2012). For example, previously undetected levels of homelessness are often brought to the fore after earthquakes (U.S. Geological Survey, 1998: 1553-D, 26), and the many mudslides after the 1998 El Niño storms (compounded by wildfire) created an impetus for future collective action and local enforcement of due process for land use in southern and central California (Starr, 2004). Taylor (1972: 112) noted that emergent organizational responses to disaster sometimes “appear as completely new organizations; sometimes they grow within the framework of pre-existing organizational structures” (also see Parr, 1970). When formally organized as volunteer or semiprofessional organizations comprising local area residents, such civic action can become reproducible over the trajectory of the community’s recovery, which typically lasts years if not more than a decade (e.g., Wright et al., 1979; Kreps, 1984). Even when started “within the framework of pre-existing organizational structures,” such organizations are often incorporated as new nonprofits because their activities and serviced populations are very different from those of the organizations from which they drew resources and borrowed networks, organizing models, and governance structures (e.g., Arend, 2007; Phillips, 2009: 441).

Nonprofit human services organizations have come to represent a sector between the markets and the state that helps provide collective goods in varying degrees of exclusivity (Wuthnow, Anheier, and Boli, 1991; Hasenfeld, 1992). They include organizations providing services such as free meals, affordable day care, housing for seniors and low-income residents, abuse shelters and counseling, and family-related services. They exist in forms ranging from large, professionally managed charitable organizations, both religious and secular, to local

neighborhood and volunteer groups, and their founding represents an important form of local social entrepreneurship. Valuable as such organizations are, why some kinds of communities are more likely to found them when the need emerges has been unclear.

Diversity of Voluntary Associations

Tocqueville (1899) marveled at the variety of causes that Americans voluntarily joined together to address and the many ways in which such associations influenced the civic sphere. Organizationally, the unique American context—large spatial distances, and a federalist model borrowed from the U.S. Constitution (Skocpol, 2003: 40–43)—have led these associations to be predominantly local in their functioning, types of benefits, and charitable causes, while retaining national ties (e.g., Charles, 1993; Skocpol, 1997; Phillips, 2009: 441). They include organizations such as parent–teacher groups, garden clubs, labor unions and employee associations, farm bureaus and granges, homeowners and tenants associations, neighborhood and block associations, volunteer fire departments and posses, amateur sports leagues and clubs, recreational clubs based on varied interests such as in automobiles or gardening, business associations and local Chambers of Commerce, women's clubs and men's clubs, mutual insurance associations, employees' beneficiary associations, alumni associations, old-school fraternal societies such as the Shriners and the Elks, fraternal service clubs such the Rotary and Lions Clubs, fraternal organizations that restrict membership by religion or ethnic origin such as the Knights of Columbus and Sons of Italy, and posts of veterans' groups such as the American Legion and VFW. I refer to the diversity of these voluntary associational forms both as associational diversity and form diversity.

Voluntary associations provide avenues of social interaction, a source of social ties, and

voice in the civil sphere. For example, Putnam and Feldstein (2003: 175) noted how members of the Harvard Union of Clerical and Technical Workers saw their membership in the employee association as being more about community than collective bargaining. Yet solidarity alone is not enough to foster solutions. In a qualitative study of responses to severe winter blizzards in Germany, Dombrowsky (1983: 183) noted:

Durkheim's 'organic solidarity' is characterized by the socially prescribed existence of seemingly useful functions and function holders, which become accomplices through their mutual application. But nothing will remain of these silent accomplices when disasters destroy their objective functioning. . . . How must a solidarity be conceived which doesn't collapse in disaster, but on the contrary is stimulated or even induced by disaster?

In a community that is used to dealing with mundane daily struggles and role-specified operation in social units, disaster necessitates novel responses in familiar contexts and innovatively using familiar building blocks.

Form diversity of voluntary associations. Organizational form comprises a mapping of the organization's activities to the structure of relationships and legal constraints under which those activities must be carried out (Tucker, Singh, and Meinhard, 1990; Hannan and Freeman, 1993; Hsu and Hannan, 2005). For voluntary associations, this includes the kinds of collective goods supplied through the organization's activities, the organizational structure through which these activities are carried out, and the legal structure that determines the reporting requirements of regulators and the default expectations of donors, contributors, and beneficiaries. Voluntary associations have varying organizational forms owing to historical imprints at their inception, different participatory styles and governance rules, and relationships with other organizations in the state, market, and voluntary sectors (Smith and Lipsky, 1993: 24; Stolle and Rochon, 1998; Skocpol, Ganz, and Munson, 2000; Baggetta, 2016). Hence they offer different organizing models for voluntary civic action. Clemens (1996: 211) suggested that organizational forms and their associated repertoires of coordination and governance are together a kind of 'cultural

competence' for organizing, which includes the ability to identify solutions, port organizational models, mobilize resources and skills, and incorporate in a form that will enable the organization to draw volunteers, resources, and clients (also see Aldrich and Yang, 2012).

Even as disaster provides an exogenously imposed opportunity for social entrepreneurship, the environment in which the community normally operates, including its vital human, material, and institutional resources, is also disrupted (Comfort, 1985: 157). To found organizations in such an environment requires connecting the right sets of people, information, and resources in the face of uncertainty and the novelty of organizational challenges (Thompson and Hawkes, 1962; Thompson, 1967: 52–53). Access to a wider variety of skills and organizing models for providing various kinds of collective goods makes it more likely that appropriate social-organizational responses will emerge, such as through bricolage (e.g., see Baker and Nelson, 2005; Di Domenico, Haugh, and Tracey, 2010). Through the organizational memberships of friends, family members, coworkers, or neighbors, prospective entrepreneurs in such communities—both individuals and groups—are able to choose and learn from a diverse array of possible voluntary organizing models and resource mobilizing arrangements to find the right sets of skills, resources, and people in the midst of physical and temporal disruptions.

Hypothesis 1 (H1): The greater the diversity of voluntary organizational forms in a community before a disaster, the higher the founding rate of local human services organizations in the year after the disaster.

Novelty and complexity of the disaster shock. No matter how prepared a community or how experienced an emergency management team is, every disaster provides unique patterns of physical damage, humanitarian need, and resource uncertainty (Thompson and Hawkes, 1962; Alexander, 1993: 428; Platt, 1999; de Boer and Sanders, 2005). Disasters also vary in their unexpectedness based on geographic and topological features, so different kinds of natural

events are novel in varying degrees based on location. Communities have collective memory, coping routines, and some organizational learning from having experienced particular kinds of natural disasters in the past. For example, fire-prone regions or areas familiar with coastal storms have preexisting coordination routines and institutionalized knowledge that can be activated in times of those familiar natural events. But unexpected disasters bring with them unforeseen challenges. Examples include physical damage to houses, roads, and bridges built without allowance for the unexpected events; supply-chain disruptions of essential commodities; contamination of or damage to utilities such as water, gas, and electricity; psychological trauma to workers blindsided by the impact of an unfamiliar natural event; and the devolution of living conditions in poor and working-class districts where planning for a low-probability event was a low priority (e.g., Ayres, 1994; Bolin and Stanford, 1998; Rovai and Rodrigue, 1998; U.S. Geological Survey, 1998; Antoine, 2008; Lyons, 2010). These represent not only locally novel patterns of emergent needs but also novel constraining conditions under which any organization that seeks to address those needs would have to operate. The organizational problem faced by prospective founders in such communities—of finding the right sets of local organizing skills, resources, spaces, and coordination templates—might require more novel solutions. Therefore:

Hypothesis 2 (H2): The effect of pre-disaster voluntary association diversity in enhancing the rate of post-disaster foundings of local human services organizations is greater for lower-probability natural disaster events than for higher-probability natural disaster events.

The organizational challenges posed by disaster can be amplified in another way. Even though disaster shocks themselves are not extremely rare, what is undoubtedly rare is to have the same geographic community experience multiple natural disasters, either simultaneously or in the space of a few months. For example, when the Coalinga earthquake struck parts of Southern California in May 1983, some communities were already in the throes of widespread storms,

flooding, and landslides. Not only were there several injured, traumatized, and suddenly unemployed people due to the earthquake, but also the displacement from the storms and flooding added a layer of complexity that any entrepreneurial responses had to contend with apart from the earthquake itself. As Page (2011) and others have noted, the incremental benefits of a diversity of solution models increase with the complexity of the challenge. When multiple kinds of disasters occur in a community, they provide more complex patterns of disruption and humanitarian need and consequently more complex organizational challenges.

Hypothesis 3 (H3): The effect of pre-disaster voluntary association diversity in enhancing the rate of post-disaster foundings of local human services organizations is greater when multiple kinds of natural disasters hit a community in any year, compared with a single kind.

Methods

The unit of observation is a county, observed annually for all 58 counties in California in the period 1990–2010. The dependent variable is the number of foundings of human services organizations in a county-year in the period following a natural disaster. The independent variables are disaster shocks and the form diversity of voluntary associations. Control variables, measured before the disaster, include the density of voluntary associations, density of local human services organizations, demographic characteristics, political diversity, racial diversity, and recent prior experience of disaster.

To test the proposed hypotheses, I used conditional models for panel count data, with effects conditional on county, which is the group variable. I also added indicator variables for year to rule out year-specific variations in weather, filing requirements, IRS enforcement (which affects data fidelity), and the economic and policy environment. I also ran models testing responses to alternative demand conditions, alternate classifications of voluntary organizations, and alternative measures of founding.

Counties as Units of Observation

The choice of counties as units of observation is based on three considerations. First, counties are relevant administrative divisions for federal disaster aid and recovery efforts following a disaster. Disaster declarations are made at the county level, and any organization within the county can apply for federal money for damages as well as for welfare contracting work, though who gets aid varies by political influence. Even though such external resources typically flow to the larger organizations, what is pertinent is that the county is treated as the administrative unit for disaster aid and recovery.

Second, studying too fine-grained units of observation makes it hard to see trans-local patterns of demand and supply of social entrepreneurship. Places where the demand for human services is high don't necessarily overlap with places where the prospective civic entrepreneurs with resources and connections live. Within a county, there is typically a single large city and several suburbs and industrial or agricultural districts, depending on the size of the main seat of the county. Cities, neighborhoods, and suburbs in California often come to be segregated based on race and income, efforts of city governments notwithstanding (Mattern, 2001; Gordon, 2004; Le Goix, 2005). Entrepreneurs from more affluent areas often start organizations in less affluent areas, and organizations set up in part of the county serve people across larger stretches, so foundings in particular cities and suburbs are unlikely to reflect the local supply of entrepreneurs and resource holders. For example, service clubs in San Francisco set up temporary soup kitchens and youth volunteer programs in Bayview, which is a suburb of San Francisco, while affordable housing programs registered in Bayview include founders from residential districts of San Francisco. Other examples include Meals on Wheels programs, such as that in the affluent

city of La Verne near Pomona, which serves populations in the less-affluent neighboring city of San Dimas.

Third, new suburban towns and incorporated areas may emerge over time, and municipal boundaries of existing towns and incorporated areas often change as a result of expansion or (less often) contraction, even as the voluntary associations in which people participate remain largely stable and rooted to their original place. For example people move to the suburbs to raise families while retaining strong ties to historical fraternal associations located downtown. So the absence of voluntary associations in a narrowly defined unit of space may not reflect a lack of availability of voluntary associations, but instead the rate of expansion of residential communities farther away from the centers of those associations. Conversely, for rural counties such as Yuba and Imperial Counties, where the population is more widely distributed in space, civic action in a small town often requires drawing on resources such as churches, clubs, and recreation centers from nearby towns and incorporated areas in the county (e.g., Lichter and Brown, 2011). Additionally the boundaries of these spatial subunits often emerge or change based on demographic changes. But counties have had static boundaries in California since the mid-twentieth century and are unaffected by the shifting boundaries of its subunits. They are also large enough in the aggregate to reflect the wider access and membership patterns of recreational associations, social clubs, volunteer fire departments, and so on, while also representing meaningful administrative boundaries for disaster assistance.

Foundings of Local Human Services Organizations

The dependent variable is the number of human service organizations founded in a geographic community in any year. The analyses are based on foundings of local non-branch,

non-religious, non-foundation human services organizations from 1991 to 2010. I identified organizations on an annual basis based on their unique employer identification number (EIN) and included both incorporated and unincorporated nonprofit organizations. The latter, while not needing to file an article of incorporation, are still required to file tax returns when they have receipts of \$5,000 or more. I assembled data on local human services organizations from the National Center for Charitable Statistics (2012), using the NCCS Core Files of organizations filing 990 or 990-EZ forms, and also included the so-called “zero-filers” who file 990-EZ or 990-N returns. The data, which were assembled in yearly files, were combined and cleaned to remove duplicates, match missing information from other public sources (GuideStar, other NCCS files, and occasionally the Foundation Center search), correct spillovers across columns (an error that sometimes occurs when recognizing text from paper scans), and verify geographic location. Most organizations in the dataset have annual gross receipts greater than \$25,000, but organizations that have annual gross receipts higher than \$5,000 (but less than \$25k) at the time of founding are also included. Smaller organizations typically file 990-EZ or 990-N (e-postcard) forms, which require fewer items of reporting (Internal Revenue Service, 2010, 2012). The latter are typically based partly or wholly on unpaid local volunteer labor and in-kind resources, so their reach and impact are often much larger than the revenue numbers reflect.

Enumerating organizational life histories. When nonprofit organizations stop filing tax returns for any reason, the IRS sends them reminder notices but doesn't penalize them for delayed filings. If an organization fails to file 990 forms for three consecutive years, its nonprofit status is automatically revoked. Failures and foundings therefore need to be based on a three-year period of missing observations at any time due to delayed filings. An organization is considered as having been newly founded if it has not filed 990 forms in the previous three or

more years in a row. For example, if an organization didn't file a 990 in 1987, 1988, 1989, and 1990, and it first appears in 1991, then it was founded in the year ending in 1991 (the period between the end of 1990 and end of 1991). Less than half a percent of cases have organizations reemerging after a gap of four or more years, often with a new classification. I considered those to be new foundings that use an old EIN; dropping them doesn't change the results significantly.

Classification. Human service organizations are classified based on the National Taxonomy of Exempt Entities (NTEE) describing the major group to which they belong (e.g., nutrition), their activity area, and the specific type of organization (e.g., soup kitchen). For counting foundings, I considered organizations in the subsets of codes under the K (food and nutrition), L (housing and shelter), P (human services), I (crime and abuse prevention and legal help), J (vocational training and employment services), and O (youth services) categories, as detailed in the Online Appendix (<http://asq.sagepub.com/supplemental>).

In tabulating foundings of local human service organizations in a county in any year, I considered only foundings of non-branch organizations. The foundings of new branches of large federated organizations are likely to be based on external factors such as media exposure and the prominence of a disaster event rather than the community's indigenous voluntary organizing skills and experiences with the provision of collective goods. I excluded religious human services organizations because such organizations are likely to be charitable arms of congregations and denominations or larger faith-based charities. These organizations aren't required to file tax returns in most cases, and although they may play a big role in human-service delivery work, their appearance after a disaster is difficult to tie directly to the local voluntary organizing skills and expertise.¹ I excluded nonprofit hospitals and healthcare providers because

¹ When controlling for density of human service organizations in the models predicting foundings, however, the density of branch and religious organizations is also added because they exert relevant competitive pressures.

such organizations require certified skills and are rarely founded by local civic action alone. Specialist disaster preparedness and relief organizations are excluded, because they are directly relevant to the disaster shock, are mostly branches of large established organizations, rarely turn over, and are funded largely by post-disaster public management grants and emergency education grants from the federal and local government. As such it is hard to say if the emergence of such topical organizations in a community truly reflects local organizing or is a direct consequence of federal disaster aid. The organizations whose foundings I analyze as a measure of local social entrepreneurship are therefore best described as local non-branch, non-religious human services organizations. Figure 1 shows the number of foundings of local human services organizations by year in California in the period 1991–2010.

[Insert Figure 1 about here]

Exogenous Shock: Natural Disasters

Natural disasters are infrequent but hardly rare events. Since 1954, large-scale natural phenomena in the U.S. such as floods, wildfires, hurricanes, tornadoes, earthquakes, and droughts have been followed by disaster declarations and handled by a division of labor among several federal and state agencies. These include “major disaster and mass emergency” declarations, which allow for large-scale appropriations from the president and Congress and long-term assistance from federal agencies. Also provided is selective aid to state agencies and management help from FEMA to the respective State Emergency Management Agency. I gathered data on disaster declarations from the FEMA website (Federal Emergency Management Agency, 2012) and represented a disaster shock as a dummy variable set to 1 if there was a disaster declaration in a particular county in that year. I excluded “assistance declarations,” such as for fire management assistance, which merely allows rescue authorities from other states to

join in recovery from smaller wildfires, for example. The gray bars in figure 2 illustrate the number of counties with a disaster declaration by year in California.

[Insert Figure 2 about here]

Federal aid. The black dots connected by a dashed line in figure 2 show the total federal disaster grants disbursed in California by year, excluding loans to individuals and small businesses; see the Online Appendix for details. Data on federal aid disbursement are typically provided on the FEMA website, but FEMA erases aid data after a few years. Thus I obtained the federal disaster funding data for the period 1990–2010 from the archives of the Public Entity Risk Institute at the University of Delaware. More fine-grained breakup of the aid, such as the amount of public assistance to local governments and hazard mitigation grants, are available at <http://data.gov> but are outside the scope of this study.

Disaster Types: Novelty and Complexity

I classified disaster events in six categories: earthquakes, flooding (including from tidal waves), storms (including coastal storms and hurricanes), wildfires, extreme snowfall and freeze, and drought. Different places have differing propensities for particular kinds of disaster, and so some disaster shocks can be more novel or unexpected for a community. I calculated novelty or unexpectedness of any disaster event as the ex-ante probability of the disaster being of a particular kind given a disaster (of any kind) has happened, based on the proportion of past disasters of the focal kind among all disaster events in the previous 30 years in the county. This creates a continuous measure of novelty or unexpectedness for any disaster event in a particular place and time. I split the continuous measure across the median to create two conditional dummy variables, one indicating whether a lower-probability disaster event has happened and

the other indicating whether a higher probability (less novel) disaster event has happened.²

A source of complexity of the disaster-imposed conditions is the number of kinds of disaster incident to the community. Most places had only one kind of disaster in any year. But in some cases communities were hit with multiple kinds of disaster, such as wildfire and earthquake or El Niño storms and flooding from overflowing rivers. In testing H3, I replaced the disaster dummy variable with two dummy variables, one representing a single kind of disaster having happened in a year and the other for instances of multiple kinds of disaster occurring in the community in the same year.

Diversity of Voluntary Associations

Voluntary associations are identified based on their NTEE categorization, and the kinds of associations included were listed previously. I calculated associational diversity, the independent variable, for each county-year, based on the indices of richness/variety proposed by Shannon and Weaver (1949). The Shannon index is calculated as $(-\sum_{i=1}^n p_i \log(p_i))$ where n is the total number of types, p_i is the proportion of the i th type in the community, and $\log$ is the natural logarithm. The Shannon diversity of voluntary associations is the exponential of the Shannon index, which is calculated as $Exp\left(-\sum_{i=1}^n p_i \log(p_i)\right)$. Exponentiating the Shannon index produces what is called “true” diversity and makes it directly comparable across communities

² I did this instead of using the continuous measure directly because the rarity/novelty of a disaster is conditional on experiencing a disaster event. When a continuous measure (or a reversed form of it) is used, real zeros (or low values of the measure) and structural zeroes (owing to no disaster happening) become indistinguishable. Thus with a continuous measure it's hard to say if the interaction effect is because of a zero/nonzero disaster event or because of a high/low probability event. Using dummies not only allows them to be separated but also allows for post-estimation tests comparing the two interaction terms (for lower- and higher-probability events) and ease of interpretation of results. Thirty years was the longest possible moving window I could capture based on the available data. Alternate novelty measures using 10- and 20-year historical windows provide similar but weaker results when using progressively shorter historical windows.

(Jost, 2006). For example, a community with a Shannon index of 1.61 has diversity equivalent to a community with $\exp(1.61)$, or 5, equally common types. For greater detail on the properties of Shannon diversity and its applications see Jost (2006) (also see White, 1986: 199–201; Pelled, Eisenhardt, and Xin, 1999; McDonald and Dimmick, 2003; Page, 2011: ch. 2). Shannon diversity is an appropriate measure in this context because what matters for community organizing capacity is not just the distribution of resources across associational forms but the absolute number of forms in the community, which provides a repertoire of organizing models and experience to draw on.³ In Harrison and Klein's (2007) framework, the kind of diversity being measured is closest to what they call "variety."

Control Variables

Control variables include population (in thousands) and other demographic characteristics such as percentage of the population in poverty, the unemployment rate, and the proportion of seniors and children in the population. Population for a year in a county is based on intercensal estimates provided by the California Department of Finance (2013). The population of California counties ranged from around 1,100 for Alpine County in 1990 to about 9.8 million for Los Angeles County in 2010. The percentage of the population in poverty is based on counts provided by the U.S. Census Bureau's (2013) Small Area Income and Poverty Estimates (SAIPE). Unemployment rates are calculated based on the percentage unemployed among labor force participants, using the Local Area Unemployment Statistics (LAUS) database of the

³ When the number of available types across units of observation is constant, Simpson and Shannon diversity behave in a similar way, because species richness is constant, and the only increases in diversity can come from evenness of the population across types. But when the units of observation have great variation in both evenness and richness, using Simpson's measure overweights concentration (such as in a few categories) and underweights richness of types (such as the presence of a long tail of many types).

Bureau of Labor Statistics (2013).

The percentages of seniors and children are used as controls because these sub-populations are likely to influence founding rates and also the variety of associations in the community. Intercensal estimates of seniors (people older than 65) and children (17 years or younger) are reported (per statute) by the California Department of Finance (2013); they are derived from census figures and intercensal reports of birth and mortality from the CDC. The very recent history of natural disaster events in an area is controlled for using a dummy variable that is set to 1 if there was a disaster or mass emergency declaration in the five years preceding the previous year. I calculated the pre-disaster political diversity of a community based on the declared political affiliation of registered voters. I used registration information instead of voting information because voting preferences are often driven by candidate effects rather than party registration. Voter registration and affiliation data are available from the California Secretary of State (2013), who is required by state law to report annual lists of voter registration by party (see the Online Appendix for more detail).

I calculated racial diversity of communities for county-years based on five categories: Caucasian, African-American, Hispanic, Native American, and Asian and Pacific Islander using intercensal estimates of racial composition made available per statutory requirement by the California Department of Finance (2013). These are calculated based on annual birth and mortality statistics from the CDC and migration data and are reported at the county level. Summary statistics of control and independent variables, and pairwise correlations, are provided in table 1.

[Table 1 about here]

Models

Count data are typically modeled as a Poisson process, which describes the frequency of counts generated from several binomial draws. Poisson models, however, have the underlying assumption that the variance is not significantly different from the mean. For panel Poisson models conditioning on group-specific means, the assumption is that the ratio of the variance to the mean is largely constant across groups (i.e., group heterogeneity is described by a single disturbance to the group mean parameter). Both of these assumptions are often violated in the analysis of organizational foundings, with variance typically much higher than the mean. One way to correct for such overdispersion (but not underdispersion) is to allow the mean of the Poisson process to be distributed as gamma. This produces the negative binomial model, which is a two-parameter model: there is a mean parameter and an overdispersion parameter that describes the extent to which the variance deviates from the mean per unit of the mean (Cameron and Trivedi, 1998). In estimating these models by maximum likelihood, the overdispersion parameter is estimated first by maximum likelihood (instead of deterministically) and held constant for estimating the corrected form of the Poisson model. This pooled (or population-averaged) approach, however, encounters problems with panel data (e.g., Baltagi, 2008: 237–238; Greene, 2011: 413), especially when analyzing spatial units, which often have wide variations in both means and dispersion. The estimates of count data models need to consider not only the group-specific means but also differences in dispersion. Hence the Hausman, Hall, and Griliches (1984) conditional model (HHG model) for a fixed-effects negative binomial model is used, which can be represented as:

$$(Foundings_{it}|\delta_i) = (1.Exposure_{it}) \times \exp \left[\left(\sum_{k=1}^n x_{itk} \beta_k \right) + \varepsilon_{it} \right]$$

where foundings are distributed as Poisson with means distributed as gamma, exposure is some

direct or proxy measure of capacity, i represents the group or unit of observation, t represents the period of observation, δ_i is the overdispersion parameter for the i 'th group, x_{itk} represents the right-hand-side covariates across time and space, n is the number of covariates, β_k represents estimated coefficients, and ε_{it} is the random error. The fixed effects aren't directly estimated but instead are partialled out in the reduced-form/QMLE/conditional estimation. To resolve the "invariant-regressors problem" of the HHG model, the right-hand-side variables are formulated as deviations from the group-specific mean (instead of the plain variables) to partial out the lack of disturbances on the mean in the HHG model (also see Online Appendix; Allison and Waterman, 2002; Greene, 2007). This makes the coefficients and standard errors interpretable as conditional within-unit effects and also partials out the effect of unchanging unobservables that produce (say) high diversity for all periods within a location. These models were run with the county as the unit of observation over annual periods. I also added year indicator variables for all years to control for year-specific shocks such as legislation, the Charitable Choice ruling (which allowed direct government of social services provided by religious organizations), IRS enforcement levels, the political environment (such as election years), macroeconomic conditions, El Niño and other weather patterns, and so on. For a more detailed discussion of key modeling issues, see the Online Appendix.

[Insert table 2 about here]

Results

Control Model

The results of the statistical analyses are presented in table 2. Model 1 is the control model. The dependent variable is the count of foundings of local non-branch human service organizations in any county-year. The lagged density of human service organizations (all kinds)

in the preceding year was placed in the exposure parameter, which takes the natural log of density and constrains the coefficient to one. This leads to a base-adjusted rate interpretation in terms of magnitude. In this way, using the exposure parameter allows for explicitly parameterizing heterogeneity in the preexisting scale of different spatial units, which determines the scale of the demand-shock imposed by disaster and the scale of responses. Right-hand-side variables, except for the disaster dummy variables, were used in their mean-centered form as discussed in the Methods section. For the dependent variable (foundings) in period t , the disaster shock (or not) is for the period $t-1$, and other right-hand-side covariates are measured at the beginning of period $t-1$.

The coefficients on control variables for population and percentage population in poverty are both positive and significant. An increase in population, and also poverty levels, independently increases the rate of founding of local human services organizations. Because there are year indicators, as well as county-conditional fixed effects, these effects are over and above average annual trends as well as average population and poverty levels in a county. The effect of past density of human service organizations (of all kinds, including religious organizations and branches of large national organizations) is significant and negative but quite small.⁴ When there is already a high density of nonprofit human service organizations, new foundings are less likely. The effects of population and percentage in poverty are both positive and statistically significant predictors of foundings of human service organizations. The unemployment rate, proportion of seniors in the population, proportion of 0–17 year olds in the population, and the recent history of disaster events in the five years prior to the focal year are not statistically significant. Also, the density and diversity of voluntary associations and political diversity have no significant main

⁴ This is lagged two years to avoid collinearity problems with the one-year lagged density that is used as the exposure variable.

effects on foundings of local human service organizations.

The coefficient on the control variable for racial diversity is negative and significant. Racial boundaries carry with them the multiple schisms of interests, stereotypes, and nativism (Bean and Stevens, 2003; Christerson, Emerson, and Edwards, 2005), underlie political and economic competition (Soule, 1992), create variation in social services demanded (Galaskiewicz, Mayorova, and Duckles, 2013), and prompt differences over what collective goods and risks the community should care about (Douglas, 1992; Rao, Yue, and Ingram, 2010). Consistent with this literature, the control model indicates that local social entrepreneurship might be harder when there is high racial diversity, but the underlying forces are various and need to be understood in the context of both social and economic forces. A natural disaster event has a positive significant effect on foundings in the next period, increasing them by 11.4 percent. While disasters on their own are destructive, on average they lead to more foundings in this empirical context, which might be attributable to being in a developed economy (Kahn, 2005; Toya and Skidmore, 2007) with a long tradition of civic organizing.

Main Model

Subsequent models in table 2 test and compare in various ways the effects of voluntary association diversity on post-disaster local social entrepreneurship. These are formulated as interactions with the exogenous disaster shock. The underlying idea is that given an externally imposed shock to demand for collective goods over and above the amount endogenous to the community, those communities with greater associational diversity (pre-shock) have a higher rate of local social entrepreneurship the year after.

In model 2 an interaction term between (pre-disaster) associational diversity and the disaster

shock is added. H1—that greater associational diversity increases the rate of post-disaster foundings of local human service organizations—is supported by this model. The Akaike Information Criterion (AIC) declines after adding the interaction term, indicating an improvement over the control model. The control variables—population, poverty, and racial diversity—continue to be significant independent predictors of the founding rate. In relative magnitude terms, a one-standard-deviation increase in diversity increases the rate of post-disaster social entrepreneurship by 12 percent on average. In absolute magnitude terms, this figure corresponds to different interpretations based on the unit of observation. For example, in Los Angeles County this corresponds, on average, to 23 more (non-branch, non-religious) human services organizations being founded the year after disaster for every standard deviation increase in the diversity of voluntary associations, four in San Francisco County for the same, and less than one (0.4) in largely rural El Dorado County.

Why not associational density, or other kinds of diversity? In model 3, the aforementioned interaction term is replaced by an interaction term between the disaster shock and the density of voluntary associations in the county, per 1,000 population. The interaction coefficient is positive but not statistically significant. The number of associations on its own doesn't provide the community with sufficient organizing capacity, at least for responding to novel challenges. In model 4 the interaction effect between the disaster shock and pre-disaster political diversity is tested. The interaction coefficient is negative and significant: political diversity might impede post-disaster local social entrepreneurship. This finding is consistent with the literature, that political beliefs provide different ideological lenses for viewing what is considered a problem and what is worth solving (e.g., Graham, Haidt, and Nosek, 2009), which turn into wide schisms in the face of calamity and uncertainty (Sorokin, 1942: 159, 227;

Quarantelli and Dynes, 1976). In model 5 the interaction of the disaster shock with (pre-disaster) racial diversity is tested. The interaction coefficient is negative but not significant. Over and above its negative main effect on foundings, racial diversity doesn't have any significant moderating effects on foundings in response to the disaster shock.

Qualifying the Disaster: Novelty and Complexity

Model 6 presents a test of H2, that the more novel the natural disaster event based on a community's historical experience of disaster, the greater the effect of voluntary association diversity in enhancing the rate of local social entrepreneurship. In this model the dummy variable for a natural disaster event in the previous year is replaced by two dummy variables: one indicating a natural disaster that is less novel or unexpected based on the community's historical experience with disaster in the previous 30-year window, and the second for a disaster that is (locally) unexpected or low probability and therefore more novel. In this model the single interaction term was replaced by two separate interaction terms with voluntary association diversity for the two dummies. The positive interaction effect of voluntary association diversity in raising post-disaster foundings is statistically significant only for more unexpected events, not for disaster events that are frequent and less of a surprise for the community (for example, wildfires in Southern California). The difference in coefficients of the interaction terms is also statistically significant, at the $p < .005$ level, tested with a post-estimation difference-in-differences test using the *lincom* command in STATA. H2 is supported: an increase in voluntary association diversity increases the founding rate to a greater extent for novel (more unexpected) natural disasters than for less novel ones.

Model 7 presents a test of H3. In this model the dummy for disaster shock is replaced by two

dummy variables, one for when there is only one kind of disaster in any year and the other for multiple kinds of disasters in the community in the same year. I also included in this model interactions of both dummies with voluntary association diversity. Both interaction terms were statistically significant (for single and multiple disasters). A comparison of these two interaction terms indicates that the effect of voluntary association diversity in disaster-hit geographic communities is greater when there are multiple kinds of disaster in the same year. I compared this difference in magnitudes of interaction effects using a post-estimation test, using the *lincom* command in STATA, and it was positive and significant at the $p < .05$ level, indicating support for H3. Multiple disasters in the same year impose more complex and multifaceted challenges for a community, and so in such cases associational diversity provides access to a richer repertoire of voluntary organizing skills, resources, routines, and solution templates. Greater voluntary association diversity therefore increases the founding rate even more when there are multiple kinds of disaster in a year than when there is a single kind of disaster.

Alternative Models and Robustness Tests

[Table 3 about here]

I also considered alternative versions of the dependent variable, responses to other endogenous (non-disaster) demand conditions, sensitivity to alternate classifications of voluntary associations, and so on. These are reported in model 8 (table 2) and models 9–16 (table 3).

Size instead of number of foundings as an alternative outcome. One possibility is that a true measure of social entrepreneurship is the total size of organizations founded rather than the number, although most organizations at founding are necessarily small. Past work in organizational theory hasn't found systematic differences between using numbers or size at

founding in various empirical contexts, and models 1–7 account for several sources of variation in the size distribution of foundings in different geographic communities, but model 8 uses mass (i.e., aggregate size) of foundings as the dependent variable. Founded size is calculated as total gross receipts in the year of founding of local human services organizations in a particular county-year (in \$1,000s). Because the dependent variable is a heavily skewed non-negative variable with a long tail, it is analyzed best as an overdispersed Poisson when scaled appropriately (e.g., Allison, 2009; Cameron and Trivedi, 2010: sec. 17.3.2; Wooldridge, 2010: ch. 18; also see Silva and Tenreyro, 2006; King and Roberts, 2015, for a discussion of misspecification and standard errors). The lagged density terms in the exposure and control variables are correspondingly replaced by lagged total gross receipts of existing human services organizations in the county (in \$1,000s). The interaction between associational diversity and the disaster shock is positive and significant, as hypothesized. Additionally, in this model the main effect of associational diversity on the aggregate size of foundings is positive and significant. This result suggests that associational variety might also increase resource mobilization rates, leading to a greater mass of foundings across the board. The control for racial diversity, however, is nonsignificant in predicting the aggregate size of foundings.

Response to other (endogenous) demand conditions. This study uses the disaster shock not just as a setting of substantive importance but also as a research site of methodological value. Natural disasters, by offering exogenous shocks to the need for collective goods above the level endogenous to the community, allow for observing what kind of pre-disaster community characteristics foster greater rates of local social entrepreneurship once an externally imposed need arises. But it is useful to find out if the focal independent variable—the form diversity of voluntary associations in the community—is also a source of organizing capacity in the face of

endogenous demand conditions, such as poverty and unemployment, which necessitate a greater need for human services organizations. Although such a test is less strongly identified, it is nonetheless important as a test of generalizability beyond the exogenous shock. In model 9, the interaction between disaster shock and associational diversity is replaced by an interaction term between (prior) poverty levels and diversity of voluntary associations. The coefficient on this term is positive and significant, so associational diversity appears to enhance the founding of human services organizations when the geographic community is faced with conditions of greater poverty. The import of associational diversity is not restricted to demand conditions imposed by disaster alone. In another (unreported) model, the unemployment rate was used as a proxy for demand conditions, with similar results.

Demand or cohesion? Another question when arguing for associational diversity as a source of organizing capacity is whether it becomes valuable only under conditions of community cohesion rather than of demand imposed by natural disasters. Natural disasters create cohesion in some communities (e.g., Turner, 2012: ch. 5) and social disruption in others (e.g., Erikson, 1976: pt. 3), but in all settings they create demand for human services. It would nonetheless be instructive to compare and contrast the effects of associational diversity on founding rates when faced with other sources of demand (but not cohesion) and cohesion (but not demand).

One source of cohesion pointed out by an extensive literature is racial homogeneity (e.g., Christerson, Emerson and Edwards, 2005; Rao, Yue and Ingram, 2010), and political homogeneity is another (e.g., Graham, Haidt, and Nosek, 2009). Model 10 in table 3 includes an interaction term between racial diversity and diversity of voluntary associations. The coefficient is not significant, indicating no significant differences in the effect of associational diversity on less racially diverse (and so cohesive) vs. more racially diverse communities. Similar

(nonsignificant) results are obtained when using political diversity as a proxy for (lack of) cohesion. Combined with the previous results on responses to poverty/unemployment, it appears that associational diversity enhances founding rates predominantly under conditions of higher demand rather than under conditions of greater cohesion.

Robustness to alternate categorizations of voluntary associations. One question that arises is whether the effects of associational diversity are sensitive to how we classify voluntary associations. The variable measuring diversity of voluntary associations is based on “form” as derived from NTEE codes, which is in turn based on a mix of the kind of collective goods provided, the structure by which these goods or services are organized and delivered, limitations to spheres of influence, and reporting requirements. There are also other classification systems, including (1) tax-relevant 501(c) subsection and classification codes that specify legal constraints, reporting requirements, and tax benefits, and (2) the (now defunct) IRS activity code that broadly specifies the types of collective goods provided. Compared with NTEE-based categories, using IRS activity codes increases the number of categories, while classification by subsection/classification codes reduces the number of categories.

Voluntary associations are organized in a diverse array of legal forms denoted by the 501(c)(subsection)(classification) codes. The largest category for incorporation in the data is 501(c)(3)(1) charities, which provides great benefits of incorporation but also greater legal hurdles and filing requirements (Hopkins, 1998, 2006). There are a multitude of other forms that are more specialized in their function and that vary in tax benefits, restrictions on political and business activity, and level of reporting and oversight. Examples include 501(c)(3)(6) public safety organizations, 501(c)(4)(1) civic leagues, 501(c)(15)(1) non-life mutual, and 501(c)(20) legal service organizations. In model 11 in table 3, I replaced the associational diversity measure

based on NTEE codes with one based on diversity of legal types. The coefficient of interaction of this diversity measure with the disaster shock is positive and significant. The number of legal classifications is considerably smaller in number, so the diversity scores have a lower range when using legal-form codes for categorization; thus the coefficient in the mean-centered variable is higher. In magnitude terms, a one-standard-deviation increase in legal-form diversity of associations increases the founding rate in disaster-hit communities by 10 percent.

Next I used an associational diversity measure based on (more numerous) IRS activity codes, which denote the kinds of collective goods provided by the organization and also underlie differences in the kinds of supply chains, spaces, expertise, and social knowledge required to provide such collective goods. This is shown as model 12 in table 3. The interaction effect of the disaster shock with activity-code diversity is also positive and significant but lower in magnitude. Using the IRS-classified activity codes leads to diversity having a wider range (s.d. 3.79), so the coefficient in the mean-centered variable is higher. In magnitude terms, a one-standard-deviation increase in activity-code diversity of voluntary associations increases the rate of post-disaster social entrepreneurship by about 9 percent. Thus based on models 11 and 12, the hypothesized effect of associational diversity on post-disaster social entrepreneurship is supported even with other bases of classifying voluntary associations. For more on IRS activity codes and legal classifications, see IRS (2010). For summaries of incorporation requirements, details of precedents from court judgments establishing legal bases for defining serviced populations and degree of excludability, and other qualitative details, see Hopkins (1998, 2006).

Alternative model specifications. The primary reason for choosing panel conditional negative binomial models was to be able to condition on differences in (over)dispersion between the spatial units. But I also ran tests with alternative specifications that are often used in lieu of

the HHG model based on the empirical setting. They include the panel Poisson model with robust standard errors clustered on group (e.g., Allison and Waterman, 2002) or a mean-centered random-effects negative binomial model (Allison, 2009: ch. 4). These models are often inappropriate especially for spatial data, due to between-unit heterogeneity in overdispersion, and correlated random effects, respectively. Nonetheless, I ran both specifications as robustness checks (results available on request). They both provide a worse model fit than the fixed effects–negative binomial model, but the coefficients of interest—interaction between voluntary association diversity and the disaster shock—are similar in magnitude and statistically significant. The Poisson model provides somewhat higher standard errors owing to mismatch in modeling assumptions (a lot of overdispersion), and the random effects model, which incorporates both within and between-unit variation, provides lower standard errors.

Accounting for failures and specialist disaster aid organizations. Although the disaster shock itself is exogenous to failures of human service organizations before the disaster, one question is whether the effect of associational diversity on post-disaster foundings persists when we partial out the effect of failures due to the disaster. Although the result—that associational diversity enhances the rate of post-disaster social entrepreneurship—would be valid irrespective of whether it's a replacement process or a net additive process, model 13 in table 3 aims at characterizing this. In this model, a (centered) variable counting the number of organizations that failed following the disaster is added. The effect of failures is negative and significant, indicating that when a geographic community has a high failure rate of human services organizations it also has fewer foundings of the same. The associational diversity interaction is still positive and significant and of a similar magnitude, indicating support for an additive effect of associational variety on post-disaster foundings instead of a replacement process. Controlling for failures

probably influenced by the disaster, however, implies controlling for the future in predicting the dependent variable at any time, and so such a model introduces uncertainty in the research design, such as between the pre-shock–post-shock relationship of the right-hand-side and left-hand-side variables, respectively. In model 13 the number of specialist disaster aid organizations (mean-centered on county) is also controlled for and has no significant effect. This is because specialist disaster aid organizations are mostly branches of large organizations (e.g., Red Cross), which rarely turn over so the community fixed effect partials out much of their impact.

Federal aid. Even though disasters are primarily demand shocks, a greater volume of federal aid is likely to bolster the capacity of large aid agencies, professionalized nonprofits, and local governments, reducing the need for local civic action. Does that crowd out local social entrepreneurship? The large influx of federal aid after a disaster typically ends up going to larger established organizations instead of helping build small grassroots volunteer-based organizations, reflecting both the greater prominence of such organizations as the Red Cross and the political economies of federal aid in general (cf. the Online Appendix; Smith and Lipsky, 1993; Strom, 2006). Work in welfare economics suggests that federal assistance can crowd out local civic responses (e.g., Bergstrom, Blume, and Varian, 1986; Andreoni, 1993; Payne, 1998), but it's unclear how much information prospective volunteers and donors have about government aid (Horne, Johnson, and Van Slyke, 2005).

The possibility of federal aid crowding out local social entrepreneurship is tested in models 14 and 15, in which the volume of federal disaster grants (dollars per 1,000 population) is used as a covariate. This variable has both real zeroes (0 federal aid) and structural zeroes (no disaster happened so disaster aid isn't defined), so the subset of county-years that experienced a natural disaster event in the preceding year is considered. Model 14, which is a very sparse model

without demographic controls, indicates that the coefficient on federal aid is negative and significant, so there might be some observed correlation between a greater volume of federal aid and lower founding rates of local human service organizations. In model 15, however, just adding poverty levels and population as controls makes the negative effect of federal aid on foundings become not significant, as does adding even more demographic and other controls in a more complex (unreported) model. As a result, in this setting, disaster aid itself doesn't seem to have any independent crowding-out effects when controlling for population and poverty. Extending the discussion from earlier in the paper, these models suggest that a natural disaster event is largely a demand shock to the need for local collective goods provision rather than a supply shock in the form of federal aid, the latter being endogenous to the community's demographic and economic characteristics, which determine both the extent of humanitarian need and the potential for unrest, media attention, and electoral concerns. For a related discussion see the Online Appendix.

Checking for bias from unobservables. It's often prudent to check whether unobserved factors might be inflating the effects of independent variables. The models reported in tables 2 and 3 include conditional fixed effects on location, group-mean centered right-hand-side variables, and indicator fixed effects on year, so static unobservables by location and year are already partialled out. Additionally, the fixed effects specification (unlike random effects) does not impose any assumptions about fixed effects being uncorrelated with unobservables. So static unobservables that vary by county, such as carrying capacities based on patterns of human ecology, or those that vary by year, such as economic conditions, annual regulatory changes, El Niño, and election years, are not a problem.

Nonetheless, model 16 is a check for whether there are significant unobserved factors

inflating the effects of the independent variables in ways not partialled out by the control variables and the modeling choices. To check this, first I calculated log-linear residuals from model 2.⁵ The residuals comprise two components: a random error component and a nonrandom unobservables component that might be correlated with the observables and/or the fixed characteristics of time and space. Though correlation with the fixed effects is not a problem, ideally the unobservables part of the residual should be uncorrelated with the observed covariates. In model 16, the residuals were then predicted as an outcome of the observed covariates in a panel fixed effects linear regression model, with robust standard errors clustered on group.⁶ The F-statistic for this model is .65 and not significant; the coefficients of right-hand-side variables used in the panel negative binomial models are also not significant in predicting the residuals. Hence the unobservables component (net of fixed effects) does not appear to significantly bias the estimated effects. Finally, in separate panel logit models predicting the disaster shock on associational diversity, I find the form diversity of voluntary associations ($\beta = .0006$, S.E. = .104), legal (i.e., subsection/classification code) diversity ($\beta = .005$, S.E. = .104), and activity diversity ($\beta = .037$, S.E. = .032)—i.e. alternative forms of the independent variable—to all be nonsignificant in predicting the disaster shock.

Discussion

Motivated by solving the organizational problem underlying the emergence of local social entrepreneurship, this paper offers a policy implication for disaster risk management grounded in

⁵ The (log-linear) residuals are distributed in a bell curve with mean -1.3 , s.d. $.99$, skewness $-.59$, and kurtosis 3.7 .

⁶ A panel linear model is needed for the residual because group fixed effects in the panel negative binomial model are not estimated but cancel out in the reduced-form estimation, so they are absent in the calculated residual. Year fixed effects are not added to the prediction models because those are estimated as indicators and are already included in the calculation of the log-linear residual.

the realities of the modern political and economic climate. Perrow (2007) argued for reducing the size of “targets” for disasters by decentralizing organizations and government agencies, and Mileti (1999) argued for better holistic planning such as around land-use regulation, engineering and building codes, insurance, and community outreach. But with the increasing retrenchment of dedicated government resources for disaster management and coordination, and violations of local regulations/codes discovered during catastrophic events (Bolin and Stanford, 1998; Kunreuther, 2006; Arend, 2007; Antoine, 2008), perhaps the need of the hour is to tap internal sources of organization in communities.

Although a number of case studies have described natural disasters as crucibles, in which some communities rise to the occasion and others wither away (e.g., Erikson, 1976; Klinenberg, 2002; Solnit, 2009; Lyons, 2010; Aldrich, 2012), this study poses the emergence of local civic responses or the lack thereof as a problem to be causally explained rather than an observation. Though scholars have variously paid attention to how socioeconomic conditions, social ties, or electoral participation make some populations vulnerable to disaster and others less so, they have not paid much attention to the role of voluntary associations as a source of building blocks for organizational solutions to emerge from within the community. Thus, although the density of voluntary associations represents the stock of voluntary organizing skills in the community, if associations are of the same kind then these skills are largely similar and, in network terminology, redundant. A diverse pool of voluntary associations, however, represents richness and variety—in skills for collective goods provision and experience of operating under legal constraints and the unique contexts of space—that is beneficial to responding to unexpected shocks such as natural disasters. This paper also shows this to be relevant for other demand conditions such as poverty.

Natural disasters are key events that influence organizations and the local communities in which they are embedded (Kirk, 2009; Tilscik and Marquis, 2013). By disrupting the quotidian and revealing previously invisible vulnerabilities in communities, they offer opportunities (but not necessarily solutions, cf. Klinenberg, 2002) for punctuated change in the equilibrium between the level of need and the availability of collective goods in the local community. For example, earthquakes often reveal the extent of hidden homelessness in urban centers (U.S. Geological Survey, 1998), and wildfires and landslides turn the spotlight on unsustainable exploitation of the natural environment (Hoffman and Ventresca, 2002; Starr, 2004: 65–66). In some cases they also offer the rare silver lining of disaster—an opportunity to reconfigure the social and economic infrastructure in geographic communities (e.g., James, 1911; Brooks, 2005; Solnit, 2009; Turner, 2012), which is a direction for future research.

This study also contributes to our understanding of community resilience through the relatively unexplored lens of organizational theory. In modern communities, organizations have become the vehicles through which preferences are aggregated, almost all activity—whether profit seeking or altruistic—is conducted, institutional constraints are encountered, and challenges to existing institutional arrangements are mounted (Hannan, 1988). In parallel, an increasing volume of work shows the preeminence of organizations not only as wells of social interaction and civic activity but also as tools of prosocial behavior, social change initiatives, and collective action (Wuthnow, 1998; Skocpol, 2003; Sampson et al., 2005; Walker, McCarthy, and Baumgartner, 2011). Truly resilient communities not only absorb shocks and return to prior levels of stability but also actively respond to these shocks by organizing the right sets of information (technical expertise or social knowledge), people (volunteers or professionals), and resources (money, time, in-kind goods, or spaces) into forms best suited for the exigency at hand

(Thompson and Hawkes, 1962; Thompson, 1967; Comfort, 1985). In the imagery of Meyer and Rowan (1977: 345), “the building blocks for organizations come to be littered around the societal landscape,” and this study shows that the richness of such building blocks in geographic communities is paramount, more so when faced with unique patterns of physical damage and humanitarian crisis.

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TABLES AND FIGURES

Table 1. Summary Statistics of Uncentered Variables and Pairwise Correlations between Them (N = 1160)

Variable	Mean	S.D.	Min.	Max.	1	2	3	4	5	6
1. Dummy for disaster shock	.3	.5	.0	1.0						
2. Dummy for single disaster event	.3	.5	.0	1.0	.95					
3. Dummy for multiple disaster events	.0	.2	.0	1.0	.21	-.11				
4. Dummy for less unexpected (less novel) disaster	.2	.4	.0	1.0	.62	.65	-.07			
5. Dummy for more unexpected (more novel) disaster	.1	.4	.0	1.0	.58	.47	.37	-.19		
6. Federal grants, \$ per thousand population	.1	.5	.0	11.2	.13	.14	.00	.10	.09	
7. Population in thousands	577.8	1326.5	1.1	9816.2	.17	.08	.31	.05	.14	-.04
8. Percentage poverty	14.2	4.9	5.1	31.9	.00	.01	-.01	.01	.03	.02
9. Percentage unemployment	8.8	4.1	2.0	31.0	-.06	-.03	-.08	-.05	.01	.06
10. Percent seniors (age > 65) in population	11.8	3.2	5.0	20.8	-.08	-.05	-.08	-.02	-.10	-.01
11. Percent children (age ≤ 17) in population	25.5	4.4	12.1	35.7	.12	.11	.04	.03	.16	-.04
12. Diversity of political affiliation	3.2	.3	2.6	4.0	-.10	-.10	.00	.03	-.21	.05
13. Racial diversity	2.4	.6	1.3	3.9	.09	.05	.11	.06	.05	-.08
14. No. of human services organizations of all kinds	138.9	283.3	.0	2382.0	.15	.08	.23	.06	.10	-.05
15. Dummy for natural disaster in previous 5 years	.8	.4	.0	1.0	-.01	-.02	.02	-.07	.04	-.12
16. Number of voluntary associations per 1,000 population	.5	.2	.0	1.5	-.04	-.01	-.10	-.01	-.03	.09
17. Form-diversity of voluntary associations	9.5	3.0	1.0	14.9	.17	.13	.12	.05	.17	-.20

Variable	7	8	9	10	11	12	13	14	15	16
8. Percentage poverty	.01									
9. Percentage unemployment	-.19	.68								
10. Percent seniors (age > 65) in population	-.26	-.16	-.08							
11. Percent children (age ≤ 17) in population	.10	.51	.51	-.56						
12. Diversity of political affiliation	-.07	-.20	-.37	.20	-.58					
13. Racial diversity	.46	.10	-.10	-.66	.35	-.21				
14. No. of human services organizations of all kinds	.95	-.06	-.25	-.24	-.01	-.05	.51			
15. Dummy for natural disaster in previous 5 years	.12	.03	-.02	-.08	.11	.00	.13	.12		
16. Number of voluntary associations per 1,000 population	-.24	-.37	-.13	.39	-.44	.00	-.38	-.14	-.08	
17. Form-diversity of voluntary associations	.38	-.03	-.18	-.28	.26	-.38	.49	.42	.17	-.03

Table 2. Conditional Panel Negative Binomial (FE) Models of Founding of Human Services Organizations in California Counties in 1991–2010, QMLE Estimates (N = 1140)*

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Lagged density (model 1-7)/size (model 8) of human services organizations in county [†]	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.000*** (.000)
Dummy for natural disaster event in 5-year period before last year	.016 (.058)	.022 (.058)	.022 (.058)	.034 (.058)	.023 (.058)	.016 (.058)	.025 (.058)	-.466*** (.100)
<i>1-year lagged RHS variables:</i>								
Population in thousands	.004*** (.001)	.005*** (.001)	.004*** (.001)	.005*** (.001)	.004*** (.001)	.005*** (.001)	.005*** (.001)	.015*** (.003)
Percentage poverty	.042*** (.013)	.039*** (.013)	.042*** (.013)	.042*** (.012)	.039*** (.013)	.040*** (.013)	.041*** (.013)	.180*** (.026)
Percentage unemployment	.021 (.015)	.019 (.015)	.019 (.015)	.015 (.015)	.021 (.015)	.019 (.015)	.016 (.015)	.018 (.031)
Percent seniors (> 65 years) in population	.017 (.030)	.014 (.030)	.013 (.031)	.013 (.030)	.011 (.031)	.014 (.030)	.011 (.030)	.057 (.057)
Percent children (0 to 17 years) in population	.038 (.025)	.041 (.024)	.043 (.025)	.046 (.024)	.042 (.025)	.040 (.024)	.048 (.025)	-.056 (.053)
Diversity of political affiliation	.217 (.168)	.224 (.166)	.220 (.169)	.382* (.168)	.226 (.168)	.251 (.166)	.258 (.166)	.441 (.454)
Racial diversity	-.558*** (.194)	-.508** (.194)	-.553*** (.195)	-.543*** (.193)	-.443* (.213)	-.511** (.192)	-.566*** (.195)	-.870 (.481)
Density of voluntary associations per 1,000 population	-.325 (.349)	-.267 (.349)	-.691 (.406)	-.260 (.348)	-.293 (.351)	-.216 (.347)	-.212 (.347)	-.575 (.659)
Form diversity of voluntary associations	.043 (.027)	-.007 (.031)	.047 (.027)	.036 (.027)	.037 (.028)	-.001 (.031)	.001 (.031)	.172** (.066)
Dummy for disaster shock	.108*** (.032)	.097*** (.032)	.095*** (.032)	.094*** (.031)	.102*** (.032)			.040 (.070)
Disaster shock × Form diversity of voluntary associations		.105*** (.032)						.289*** (.076)
Disaster shock × Density of voluntary associations per 1000 population			1.004 (.572)					
Disaster shock × Diversity of political affiliation				-.551*** (.144)				
Disaster shock × Racial diversity					-.375 (.261)			
Dummy for less unexpected disaster event (less novel shock)						.038 (.038)		
Dummy for more unexpected disaster event (more novel shock)						.151*** (.041)		
Less novel disaster × Form diversity of voluntary associations						.042 (.044)		
More novel disaster × Form diversity of voluntary associations						.111*** (.040)		
Dummy for only one kind of disaster in a county-year							.074* (.033)	
Dummy for multiple kinds of							.170***	

disaster in a county-year								(.052)
One kind of disaster × Form								.096**
diversity of voluntary								(.034)
associations								
Multiple kinds of disaster ×								.143*
Form-diversity of voluntary								(.056)
associations								
Constant	-1.751***	-1.718***	-1.777***	-1.777***	-1.782***	-1.701***	-1.696***	-11.64***
	(.212)	(.217)	(.213)	(.221)	(.215)	(.223)	(.221)	(.267)
Wald chi ²	2364***	2428***	2372***	2455***	2386***	2490***	2484***	1517***
D.f.	31	32	32	32	32	34	34	32
AIC	4217	4208	4216	4204	4217	4204	4208	14504

* $p < .05$; ** $p < .01$; *** $p < .005$.

* Models 1–7 predict the number of foundings, and model 8 predicts the mass of foundings (i.e., total gross revenue or receipts of newly founded organizations in \$1,000s. Conditional fixed effects on county and indicator fixed effects on year are included.

† 1-year lagged density of human services organizations in the county is used as the exposure term in predicting founding rates. The density is also used as a control variable but 2-year lagged to reduce collinearity with the exposure term.

Table 3. Alternative Models and Robustness Tests*

Variable	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Lagged density of human services organizations in county [†]	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)		-.000*** (.000)	-.000 (.000)
Dummy for natural disaster event in 5-year period before last year	.007 (.058)	.018 (.058)	.005 (.058)	.030 (.058)	.072 (.058)	-.018 (.090)	-.014 (.085)	-.023 (.085)
<i>1-year lagged RHS variables:</i>								
Population in thousands	.003*** (.001)	.004*** (.001)	.004*** (.001)	.005*** (.001)	.005*** (.000)		.006*** (.001)	.000 (.000)
Percentage poverty	.028* (.013)	.044*** (.013)	.038*** (.013)	.040*** (.013)	.029* (.013)		.068*** (.018)	-.016 (.016)
Percentage unemployment	.024* (.014)	.022 (.015)	.017 (.015)	.020 (.015)	.015 (.015)			-.003 (.015)
Percent seniors (> 65 years) in population	.004 (.030)	.013 (.031)	.030 (.030)	.010 (.030)	.009 (.030)			-.011 (.040)
Percent children (0 to 17 years) in population	.053* (.025)	.042 (.025)	.043 (.024)	.047 (.025)	.050* (.025)			-.015 (.023)
Diversity of political affiliation	.237 (.165)	.232 (.167)	.264 (.164)	.204 (.167)	.278 (.163)			-.247 (.208)
Racial diversity	-.491* (.192)	-.643*** (.206)	-.529** (.192)	-.533** (.195)	-.503** (.191)			.055 (.324)
Density of voluntary associations per 1,000 population	-.206 (.342)	-.272 (.355)	-.231 (.346)	-.229 (.351)	-.163 (.347)			.473 (.371)
Form diversity of voluntary associations	.035 (.035)	.052 (.028)			-.013 (.032)			-.028 (.040)
Dummy for disaster shock	.101*** (.031)	.110*** (.032)	.109*** (.031)	.099*** (.031)	.073* (.032)			-.019 (.065)
Disaster shock × Form diversity of voluntary associations					.113*** (.033)			
Percentage poverty × Form diversity of voluntary associations	.058*** (.012)							
Racial diversity × Form diversity of		.228 (.213)						

voluntary associations								
Diversity of voluntary associations by tax (subsection)(classification) code								
Diversity of voluntary associations by IRS activity code								
Disaster shock × Diversity of voluntary assoc. by (subsection)(classification) code								
Disaster shock × Diversity of voluntary assoc. by IRS activity code								
Number of branches of specialist disaster aid organizations in county								
Number of organizational failures following the disaster								
Federal grants, \$ per 1,000 population								
Constant	-1.543*** (.227)	-1.720*** (.215)	-1.561*** (.223)	-1.745*** (.226)	-1.611*** (.225)	-	-1.082* (.459)	.190 (1.189)
Wald chi ² (9-15), LR chi ² (16)	2533***	2384***	2517***	2476***	2542***	1473***	2062***	0.6(ns)
D.f.	32	32	32	32	34	20	23	12
Number of obs.	1140	1140	1140	1140	1140	351	351	1160
AIC	4199	4218	4196	4202	4196	1356	1301	3084

• $p < .05$; ** $p < .01$; *** $p < .005$.

* Conditional panel models of foundings in response to other sources of demand such as poverty (9), sources of cohesion (or not) such as racial diversity (10), with alternate classifications of voluntary associations in calculating diversity (11-12), with more controls (13), sparse models with federal aid on disaster affected subset (14-15), and predicting log-linear residuals from model 2 on covariates (16). Reduced-form/Quasi-ML estimates. Conditional fixed effects on county included. Indicator fixed effects on year included except in model 16.

† 1-year lagged density of human services organizations in the county is used as the exposure term in predicting founding rates. The density is also used as a control variable but 2-year lagged to reduce collinearity with the exposure term.

Figure 1. Number of total foundings of human services organizations in California, by year.

Figure 2. Number of counties affected by disaster and volume of federal grants, by year.