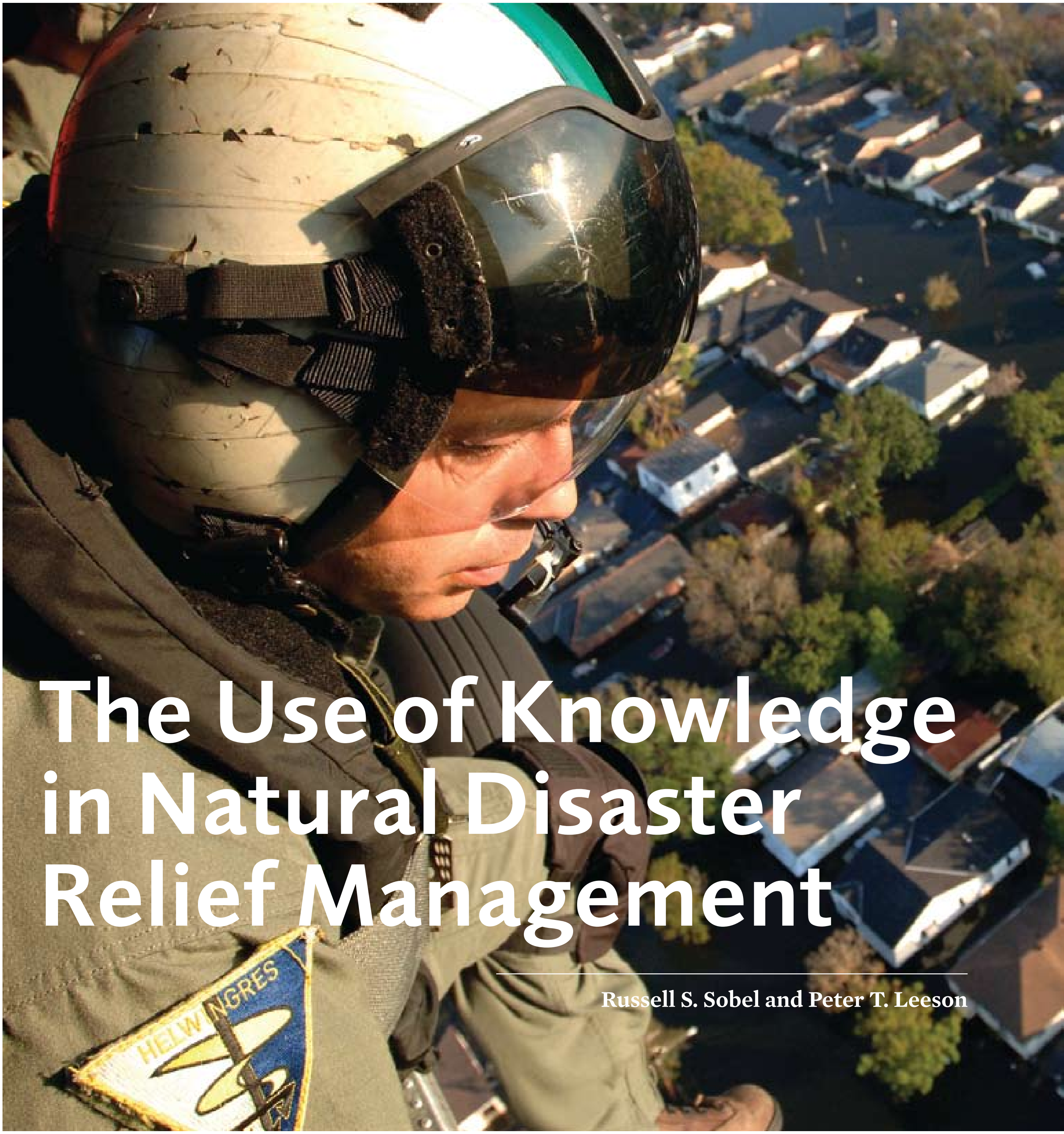

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The Use of Knowledge in Natural Disaster Relief Management

Russell S. Sobel and Peter T. Leeson

MORE THAN SIXTY years ago, F. A. Hayek identified the problem of social coordination in his seminal article, "The Use of Knowledge in Society."

> The peculiar character of the problem of a rational economic order is determined precisely by the fact that the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form, but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess. The economic problem of society is thus not merely a problem of how to allocate "given" resources—if "given" is taken to mean given to a single mind which deliberately solves the problem set by these "data." It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only those individuals know. Or, to put it briefly, it is a problem of the utilization of knowledge not given to anyone in its totality.[1]

Hayek's critical insight, later called "the knowledge problem," highlighted two central features of social organization. First, every society confronts a "division of knowledge" analogous in many respects to the "division of labor." Information is fragmented, diverse, and often contained in inarticulate forms, held separately and locally by the many individuals who compose society. Second, the foremost obstacle that every effort at social coordination must overcome is somehow tapping into this dispersed information and processing it in forms that individuals can use to achieve their ends mutually.

In this article, we investigate natural-disaster management, using Hayek's key insight about the fundamental "knowledge problem" that all efforts to coordinate social activity must solve. We argue that natural-disaster manage-

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1. F. A. Hayek, "The Use of Knowledge in Society," *American Economic Review* 35, no. 4 (1945): 519–20.

ment is no different in this regard than the coordination of individuals in "normal" economic contexts.

Following a natural disaster, on the one side, there are "relief demanders"—individuals who desperately need disaster-relief supplies, including evacuation, food, shelter, medical attention, and so forth. On the other side, there are "relief suppliers"—individuals ready and willing to bring their supplies and expertise to bear in meeting the relief demanders' needs. On both sides of this "market," information is decentralized, local, and often inarticulate. Relief demanders know when relief is needed, what they need, and in what quantities, but they do not necessarily know who has the relief supplies they require or how to obtain them. Similarly, relief suppliers know what relief supplies they have and how they can help, but they may be largely unaware of whether relief is required and, if it is, what is needed, by whom, and in what locations and quantities.

We find that decentralized, private decision making effectively generates the appropriate knowledge at each stage. Centralized, political decision making, in contrast, by its very nature cannot do so.

We argue that effective natural-disaster relief management, just like successful social coordination in "normal" circumstances, must solve Hayek's knowledge problem. Specifically, effective disaster management requires efficient information generation at three critical stages. The first is the recognition stage: Has a disaster occurred, how severe is it, and is relief needed? The second is the needs assessment and allocation stage: What relief supplies are needed, who has them readily available, and what areas and individuals need them the most? The third stage is the feedback and evaluation stage: Are our disaster-relief activities working, and what—if anything—needs modification?

Hayek suggested a solution to the knowledge problem in the context of economic decision-making in general. Given information's decentralized nature and its importance in achieving social coordination, he argued that it was important to allow decentralized private actors, such as those participating in markets, to direct the bulk of economic decision-making. Unlike markets, central planning has no way of tapping into this information in a productive way, as Hayek argued.

> If we can agree that the economic problem of society is mainly one of rapid adaptation to changes in the particular circumstances of time and place, it would seem to follow that the ultimate decisions must be left to the people who are familiar with these circumstances, who know directly of the relevant changes, and of the resources immediately available to meet them. We cannot expect that this problem will be solved by first communicating all this knowledge to a central board which, after integrating all knowledge, issues its orders. We must solve it by some form of decentralization.[2]

Using Hayek's insight, we compare the government's ability and the private sector's ability to generate the appropriate knowledge at each of the three critical disaster-management information stages.[3] Consistent with Hayek's argument, we find that decentralized, private decision making effectively generates the appropriate knowledge at each stage. Centralized, political decision making, in contrast, by its very nature cannot do so.

Our analysis points to information acquisition and exploitation as the fundamental failures of government's disaster-relief management. Government's informational deficit in the disaster-relief context is an unavoidable outcome of the centralization of disaster-relief management when relief is provided by the state. Disaster-relief reforms that leave government as the primary manager of natural disasters are thus bound to fail. Correcting government's information failure in the context of disaster relief requires eliminating its root cause: government involvement itself. Although our discussion focuses specifically on Hurricane Katrina, the information issues we analyze provide important general lessons about disaster-relief management.

2. Hayek, "The Use of Knowledge in Society," 524.
3. The arguments in this article build on and extend discussions in Russell S. Sobel, and Peter T. Leeson, "Flirting with Disaster: The Inherent Problems with FEMA," *Policy Analysis*, no. 573 (2006) and Russell S. Sobel and Peter T. Leeson, "Government's Response to Hurricane Katrina: A Public Choice Analysis," *Public Choice* 127, nos. 1–2 (2000): 55–73.

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Information Stage One: What Disaster?

INFORMATION DEPENDS FUNDAMENTALLY on the institutional context in which it is created. All institutional contexts develop some kind of information, but very few generate the kind needed to coordinate spatially and temporally separated suppliers and demanders. In the context of disaster relief, the first piece of critical information involves whether a disaster has occurred and thus whether relief assistance is needed.

Information about the occurrence of a disaster and the need for disaster relief might seem straightforward. However, when disaster-relief management is politically centralized, it is often not. Perhaps surprisingly, the vast majority of disasters declared over the past decade have been for weather events that most people would not consider disasters at all, such as severe thunderstorms, wind, and snow.[4] However, some seemingly major disasters have gone undeclared. The disaster declaration process is clearly more complex and subjective than it first appears.

When disaster relief is centralized and managed by government, it necessarily becomes bureaucratized. Government agencies such as the Federal Emergency Management Agency (FEMA) are created to oversee and administer relief. These agencies, in turn, are overseen by other government agencies, each with its own internal bureaucracies, and so on. Following organizational changes after 9/11, for example, FEMA was placed under the umbrella of the Department of Homeland Security, adding new political decision-makers to the mix. The layers of bureaucracy ultimately end at some key administrative figure—the president, in the case of disaster relief—who must declare a disaster before FEMA can act. At each level of the bureaucratic process, a key political decision-maker must give his approval before a proposed action may be considered at the next layer of the bureaucracy.

Bureaucracy is a necessary and unavoidable outgrowth of state-run activities. It is necessary because government agencies, unlike private firms, whose activities are guided by profit seeking, have no such guide.[5] Private firms seek profits and consequently have but one rule for their managers: maximize profits. Managers who contribute to the firm's goal and make profits can be rewarded and retained, whereas those who do not contribute can be punished or released. Owners' ability to measure managers' contribution to this goal rests on monetary profits and losses.

Government agencies, in contrast, cannot make do with one rule for their "political managers." Because these agencies do not seek to make profits and do not sell anything, they

4. Thomas A. Garrett, and Russell S. Sobel, "The Political Economy of FEMA Disaster Payments," *Economic Inquiry* 41, no. 3 (2003): 496–509.
5. Ludwig von Mises, *Bureaucracy* (New Haven, CT: Yale University Press, 1944).

Photo: Carrie Conko

cannot use profits or losses to direct managers' activities and to ensure that managers contribute to the agency's goal. Therefore, some other guide for manager decisions and some other mechanism for checking political agents' behavior must be employed. As Gordon Tullock puts it, in the absence of the profit-and-loss system to measure and ensure that political managers undertake activities that contribute to their agency's goal, "The central problem . . . is organizing subordinate politicians so that they, to the greatest degree possible, will behave as their superiors want them to behave."[6] The political mechanism for achieving this objective is bureaucracy. In lieu of the profit objective, detailed procedures and protocols must be used to guide and check political managers' behavior.

Although bureaucracy is inherent and essential to government agencies for this purpose, it does not follow that all of its effects are positive. Detailed protocols that involve multiple layers of approval before action may be undertaken prevent political agents from engaging in activities at odds with the agency's ends and substantially slow government activities and information revelation. In the declaration of a natural disaster, for example, information that a disaster that requires relief attention has occurred does not emerge, from government's perspective, until the protocol for disaster declaration has been carried to its conclusion.

For political actors charged with relieving disaster, no disaster exists until the president, who is reached in the final stage of the bureaucratic procedure, has officially declared it, even if a disaster that requires public assistance has already struck and is readily acknowledged and visible in the news media. Unavoidable bureaucracy inherent to government management creates a separation between what might be called "private knowledge" of disaster and "political knowledge" of the same disaster.

This bureaucracy-spawned "knowledge wedge" severely limits the goals that government can achieve successfully. According to Tullock, "These limits, it should be emphasized, are limits on what can be done, not on the size of the bureaucracies that can be built. Furthermore, these limits

6. Charles Rowley, ed., "Bureaucracy," *The Selected Works of Gordon Tullock* (Indianapolis: Liberty Fund, 2005), 6:132.

are much lower if the task to be accomplished requires a high degree of coordination than if it does not."[7] The more monumental the task in terms of coordination, the bigger the bureaucratic knowledge wedge becomes and thus, the less likely government is to complete the task effectively.

The knowledge wedge explains why key government relief management figures, it appears, were not aware of the impending and eventual disaster caused by Hurricane Katrina—at least, they did not officially acknowledge such an awareness—although the citizens of New Orleans, the news media, and countless others were. The secretary of the Department of Homeland Security, Michael Chertoff, for example, did not declare Hurricane Katrina an "incident of national significance" until thirty-six hours after it made landfall, even though on August 27—two days before Katrina's arrival—the National Hurricane Center had predicted the powerful storm would hit the Gulf Coast.[8]

Government was also painfully unaware of major and fundamental developments in the relief process after Katrina hit land. FEMA director Michael Brown, for instance, became aware that hurricane victims in New Orleans had been moved to one of the city's convention centers only after a television journalist informed him of this fact. On *Nightline*, Brown admitted, "We just learned of the Convention Center—we being the federal government—today."[9]

Predictably, but perhaps ironically, the real success stories in the relief effort therefore came from those who ignored FEMA, flouted the bureaucratic decision-making process, and took action without approval. The U.S. Coast Guard, for example, began its helicopter rescue efforts without waiting for any other government agency's approval or coordination. Its efforts were so successful that the person who led them, Vice Admiral Thad Allen, was chosen as the replacement FEMA director when Michael Brown was relieved of his duties. A Canadian search-and-rescue team from Vancouver, without seeking FEMA permission, arrived in New Orleans days before any FEMA-coordinated units, giving rise to slightly inaccurate but amusing media accounts of how the Royal Canadian Mounted Police beat the U.S. government into New Orleans.[10]

One of the best examples of this voluntary initiative is what we call "the tale of two sheriffs": Sheriff Warren Evans of Wayne County, Michigan, and Sheriff Dennis Randle of Carroll County, Indiana. Both sheriffs were eager to assist the hurricane victims, and both had control over the necessary resources. Sheriff Evans, on the one hand, ignored both FEMA and his governor's instructions to wait for FEMA approval and went to New Orleans with nine truckloads of supplies and thirty-three deputies to help.[11] Sheriff Randle, on the other hand, followed procedure, was buried under mounds of FEMA paperwork, and faced an un-navigable approval process. He never made it to New Orleans.[12]

Contrasting the government's ability to learn about disaster with the private sector's information about the impending situation in New Orleans makes a useful point.

> The private-sector planning began before Katrina hit. Home Depot's "war room" had transferred high-demand items—generators, flashlights, batteries and lumber—to distribution areas surrounding the strike area. Phone companies readied mobile cell towers and sent in generators and fuel. Insurers flew in special teams and set up hotlines to process claims. This planning allowed the firms to resume serving customers in record time. . . . [T]he Business Roundtable had by August of this year arranged for each of its 160 member companies to designate a disaster-relief point man. These folks were in place and ready to help before Katrina made landfall.[13]

Why were private disaster-relief suppliers, such as Home Depot, so much quicker to identify the disaster of Hurricane Katrina and to begin attempting to remedy it? Why did insurance companies, such as State Farm, rent hotel rooms in nearby cities and send insurance agents to the affected areas even before the hurricane hit? Unlike government, private

7. Ibid., 170.
8. Jonathan Landay, Alison Young, and Shannon McCaffrey, "Chertoff Delayed Federal Response, Memo Shows," *Knight Ridder Newspapers*, September 13, 2005.
9. Tina Susman, "Effort Mired in Bureaucratic Hash," *Newsday*, September 11, 2005, http://www.newsday.com.
10. "What Went Wrong in Hurricane Crisis," interview by Stone Phillips, *Dateline NBC*, September 9, 2005.
11. Ibid.
12. Ibid.
13. "Private FEMA," *Wall Street Journal*, September 10, 2005, http://www.wsj.com.

organizations are constrained by only one rule: make profits. If a profit opportunity emerges in expectation of or following a natural disaster, private firms such as Home Depot have an incentive to respond immediately to the disaster, and they have the flexibility to do so effectively.

Further, private actors have a much greater incentive to learn about the potential for a disaster in the first place. The first business firm to arrive at a disaster area with provisions for victims stands to benefit handsomely. Even private nonprofit organizations have a strong incentive to identify disasters quickly. The faster they are in place to help those in need, the more likely are potential charitable contributors to give additional money to them.

In markets, a consumer's ability to "exit" and take his business (or charitable donation) elsewhere makes him "king." When a private nonprofit agency fails to respond, its future donations suffer. When a private for-profit firm fails to respond, it loses profit. In government, however, such incentives do not exist. FEMA will continue to use coercive taxation to finance its activities regardless of its performance in any specific relief effort. Dissatisfied taxpayers have no exit option. Within government, the "voice" option of negative media publicity and lost votes for incumbent politicians are the only incentives; there is no threat of bankruptcy.

Information Stage Two: What's Needed and Who Needs it?

After a disaster has been identified, the most important information pertains to what's needed, who needs it, and who has the means to meet these needs. Some disaster victims need water, others need shelter, and still others need food. Do the needs differ in various geographic areas? All disaster victims will probably require basic necessities, but the extent to which different individuals need these things will vary. Moreover, not all disaster victims will have an equally critical need for these items. Specific areas may need specific kinds of help, such as rooftop rescues or massive bus evacuations, which are unique and unexpected. Finally, individuals have specialized resources that only they know can solve the diverse problems that emerge in the wake of a disaster.

Consider first how private participants come to discover this information. In the marketplace, the interactions of suppliers and demanders generate market prices for various goods and services. As Hayek pointed out, these prices convey information about localized supply-and-demand conditions, indicating to suppliers where supplies are needed most and communicating to demanders when they may expand consumption (because supplies have become more abundant relative to demand) or curtail consumption (because supplies have become less abundant relative to demand).

Even the charitable activities of private individuals and nonprofit organizations, which suffer somewhat from the absence of market prices to guide them, are likely to be directed toward satisfying the most highly valued needs. Individuals making donations have an incentive and desire to make sure their donations are used effectively and an incentive to search for information about the best use of their donated resources. Nonprofit organizations that are not careful stewards of their donated resources soon find that they have fewer donations to allocate. For-profit firms that choose to be charitable are careful to allocate their resources in a way that generates value because the allocation produces the highest return to the firms in terms of reputation and thus future profits.

Private suppliers of disaster-relief essentials, such as Wal-Mart, were able to bring necessities such as water quickly to relieve the plight of Katrina victims who had been hit the hardest. While FEMA was still busy trying to distinguish between its head and its tail, Wal-Mart was already back in business, providing the items that rescue workers and victims needed, in the right quantities, at their everyday low prices, and sometimes even without charge. Wal-Mart, which has donated more than $20 million to Hurricane Katrina relief efforts, supplied the essential items hurricane victims and disaster-relief providers needed. "Over $3 million in supplies were given directly to shelters, providing a lifeline for stranded residents."[14] These supplies included chain saws, boots, sheets, clothes, water, and ice.[15] As one hurricane victim put it, "[Wal-Mart] was the only place we could find water in those first days. . . . I still haven't managed to get through to FEMA. It's hard to say, but you get more justice at Wal-Mart."[16] Wal-Mart's amazing capacity to bring

14. Sean Higgins, "Wal-Mart Is Lauded for Fast Relief Aid to Katrina Victims," *Investor's Business Daily*, September 9, 2005.
15. John Tierney, "Let Wal-Mart Take Over Emergency Management," *New York Times*, September 21, 2005.
16. Ibid.

Photo: Carrie Conko

the needed supplies after Hurricane Katrina's devastation had even the staunchest critics of the company praising it.[17]

Consider, in contrast, how political decision-makers come to know how to allocate disaster-relief supplies. Unlike the market, the political process does not generate market prices, nor does government have the incentive to be as careful a steward of the resources it hands out to needy victims. For market prices to emerge, goods and services must be bought and sold. However, the government is not selling anything, so political decision-makers do not have market prices directing them to where expenditures are needed most.

Further, government employees have a much weaker incentive than private individuals to seek information about where resources are most urgently needed and to ensure that the resources they allocate create value, even when compared to cases where private parties give away resources. Individuals are simply not as careful with other people's resources as they are with their own. These simple insights from basic economic theory go a long way in explaining the chaos, confusion, and ultimate failure of FEMA-provided disaster-relief distribution following Hurricane Katrina.

In the first week of relief activities alone, FEMA refused to ship to Mississippi trailers that could be used as temporary housing for disaster victims, turned away critical generators needed by hospitals and victims for producing electrical power, turned away trucks with water demanded by many, prevented the Coast Guard from delivering fuel critical to facilitating recovery activities, and refused Amtrak's offer to evacuate victims who desperately needed to get out of the disaster zone.[18] The last Amtrak train left New Orleans empty.[19] Even the American Bus Association, which represents Greyhound Bus Lines, offered to help FEMA evacuate the Superdome and the Convention Center, but its offer, like so many other overtures of assistance, fell on deaf ears, and the association never received so much as a reply from FEMA officials.[20]

FEMA's misallocation of relief labor and supplies seemed

17. Higgins, "Wal-Mart Lauded."
18. Democratic National Committee, "Bush's FEMA Turns Natural Disaster into Bureaucratic Disorder," news release, September 7, 2005.
19. Kathleen Parker, "Three Heroes Outwitted Bureaucracy," *New Hampshire Union Leader*, September 14, 2005.
20. Andrew Martin and Andrew Zajac, "Offers of Buses Fell Between the Cracks," *Chicago Tribune*, September 23, 2005, http;//www.chicagotribune.com.

to have no limit. It moved a medical team of thirty people capable of treating hundreds of hurricane victims from Alabama to Mississippi and then to Texas. For eleven days, medical team members say, their relief activities were reduced to treating one small cut. FEMA then moved them again—everywhere but where they were needed and could accomplish the most, which was in New Orleans.[21] As one frustrated member lamented, "We joined the team to help people who need it and we are not helping anybody."[22]

In another case of misallocated medical relief, FEMA director Michael Brown received an e-mail on September 2, 2005, describing the dire state of medical care in New Orleans and urgently inquiring about how offered medical supplies could be employed to help hurricane victims most effectively. "Mike, Mickey, and other medical equipment people have a 42-foot trailer full of beds, wheelchairs, oxygen concentrators, etc. They are wanting to take them where they can be used but need direction."[23] Because of government's inherent information deficit, Brown's only response, four days later, was to forward the message to another FEMA bureaucrat with a note that asked quizzically, "Can we use these people?"[24]

In other critical areas, resources were diverted to superfluous areas or sat idle and unused. A mobile communications unit, which could have provided much-needed equipment to relief workers and victims, for example, sat in Germany, with a chartered private plane ready to leave, for nine days.[25] Despite repeated attempts to contact FEMA to get the required permissions to come to New Orleans, these potential problem solvers, like so many others, got no response and eventually gave up trying to bring their resources into the relief effort. The information problem that plagued FEMA plagued other government officials involved with the disaster relief as well. Louisiana state police, for example, unaware of the dire local need to restore communications systems, delayed for days the technicians sent to repair damaged communications equipment.[26]

A similar situation occurred in the case of one thousand firefighters who believed that their much-needed efforts would be put to use in helping hurricane victims. Instead, they were sent to a hotel in Atlanta, forced to take days of sexual harassment courses, and eventually deployed by FEMA with only the job of handing out fliers with FEMA's phone number on it. As one firefighter astutely observed, "It's a misallocation of resources . . . completely."[27]

Information Stage Three: Is What We're Doing Working?

After establishing that a disaster has occurred, determining what is needed and who needs it, and taking action to remedy the situation, the final piece of critical information needed for effective disaster-relief management is feedback on whether or not the plan of action being pursued is actually working. Are disaster victims getting what they really need? A contrast with the private sector again reveals government's inability to generate this feedback information.

In markets, profit-and-loss accounting informs suppliers whether or not they are satisfying demanders' needs. Those suppliers who are doing so earn profits, which reward them with greater command over resources. Those who are not doing so are punished with losses and lose control of resources. Profits and losses tell suppliers whether they should expand output or alter their activities.[28] In the context of relief management, profits and losses tell private providers of essential goods such as water, food, shelter, and even private protection against criminals, whether or not they are effectively fulfilling disaster victims' needs.

Consider, for example, the numerous private security agencies that protected residents and business owners' property. These firms satisfied a demand for property-rights protection created by the government's failure to perform this task in the wake of the disaster. In Louisiana alone, within fourteen days of Katrina's landfall, the number of private security firms offering their services to disaster victims climbed from 185 to 235.[29] This growing number reflected

21. "What Went Wrong," interview.
22. Lisa Myers and NBC Investigative Unit, "Relief Chaos in Katrina's Wake," September 8, 2005, http://www.msnbc.com.
23. "'Can I Quit Now?' FEMA Chief Wrote as Katrina Raged," *CNN.com*, November 4, 2005, http://www.cnn.com.
24. Ibid.
25. Myers, "Relief Chaos."
26. Kit Roane, "Can't Reach Out, Can't Touch," *USNews.com*, September 19, 2005, http://www.usnews.com.
27. Lisa Rosetta, "Frustrated: Fire Crews to Hand Out Fliers for FEMA," *Salt Lake City Tribune*, September 12, 2005.
28. Ludwig von Mises, *Human Action: A Treatise on Economics*, (New Haven, CT: Yale University Press, 1949).
29. Jeremy Scahill, "Blackwater Down," *Nation*, October 10, 2005.

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As one frustrated member lamented, "We joined the team to help people who need it and we are not helping anybody."

the heightened profitability of providing this service, which, in turn, reflected consumers' satisfaction with the services and their demand for additional protection.

Private nonprofit organizations confront a similar feedback mechanism because they rely on voluntary donations. The nonprofits that create the most value for those they help will garner more donations, whereas those that squander their resources will suffer lower future donations. Although this feedback is not as strong as the pure profit-and-loss mechanism, it remains stronger than the feedback for government, which finances its activities through taxation. Lily Duke, for instance, an independent film producer with no previous relief experience, arrived in New Orleans with a single truckload of donated food. Because of her effectiveness in supplying aid to Katrina victims, donations to her operation increased exponentially. Within three months of the disaster's onset, Duke was operating three distribution centers that served 20,000 people a day.[30]

Because the resources under government's control are not affected primarily by performance, government lacks an effective feedback mechanism. Consequently, political actors have little idea of whether they should expand their activities, shift their activities, or drop them altogether. Political actors know only the financial costs of their activities; they have no information in the form of feedback about the desirability of these activities.[31] This situation makes the economic allocation of resources through the political process and the coordination of the supply of these resources to those who desire them exceedingly difficult, if not outright impossible.

For disaster-relief management, this situation creates a serious problem. A striking example is the provision of temporary, post-Katrina housing. Following the hurricane, cruise lines, such as Carnival, immediately offered their ships for rent to house relief workers. Their profit from this activity depended on whether the ships were docked in the areas where they were needed most. As a result, they put ships in the places that benefited hurricane victims the most. FEMA, in contrast, set up trailer parks that in many cases went virtually unused. It faced the prospect of neither profits nor losses from its decision about where to locate temporary housing. Consequently, trailers were deployed where

30. John Seewer, "Resident Becomes Aid 'Boss' in New Orleans," *Associated Press*, November 13, 2005.

31. Von Mises, *Bureaucracy*.

they were not needed, at an astonishing cost to taxpayers.

Between August and October 2005, for example, FEMA spent $1.3 billion on 95,000 trailers for hurricane victims, and in some cases, $38,000 per lot to make parks trailer ready—the total double the cost of the trailers themselves. As of October 2005, only 16,000 of these trailers (less than 17 percent), were occupied. Based on these figures, FEMA was spending an estimated $125,000 to $200,000 per family for temporary housing, even though more than one million rental apartments priced at $700 per month or less were vacant across the region.[32] As of August 2006, a much higher percentage of FEMA trailers were occupied, but many still went unused. In Louisiana, for example, 15 percent of FEMA's 95,000 trailers in the state remained unoccupied.[33] If Carnival had misallocated its resources in this fashion, the company would have suffered losses. FEMA's huge misallocation, however, carried little penalty or consequence for FEMA decision-makers, despite the considerable harm done to disaster victims. In fact, FEMA's failure was rewarded with billions of additional dollars for the agency's budget.

When disaster relief is centralized, there is an inability to evaluate effectively the ongoing success or failure of disaster-relief activities. This inability created significant problems for FEMA's Hurricane Katrina relief efforts and led government officials involved in managing the relief, at even the highest levels, to assess FEMA's success incorrectly and arbitrarily. Department of Homeland Security Secretary Michael Chertoff, for example, stated: "We are extremely pleased with the response that every element of the federal government, all of our federal partners, have made to this terrible tragedy."[34]

President Bush was equally unable to evaluate the effectiveness of the government's relief activities. Commending FEMA director Michael Brown on the agency's efforts, Bush made the now-infamous remark, "Brownie, you're doing a heck of a job."[35] He later changed his tune, calling FEMA's response to Katrina "unacceptable."[36] Though political decision-makers' assessment of government's actions eventually hit the mark, it was too late—only after changing the government's relief strategy had become a nonissue, well after the situation in New Orleans and elsewhere was already improving.

Concluding Remarks

Hayek's critical insight was that decentralized market activities generate information that coordinates the diverse ends and activities of all those participating in the market. When government substitutes central planning for markets, essential information is generated in an untimely fashion, generated inaccurately, or not generated at all. Hence, central planning cannot effectively coordinate decision-making among numerous and dispersed individuals with different endowments, wants, and needs.

Hayek's point applies to all forms of central planning. The failure of command and control in natural-disaster management is as assured as it is for the creation of five-year development plans. Neither FEMA nor any other government agency that might be charged with FEMA's task is immune to the information problem. Disaster relief, like all other forms of decision making that require coordinated human action, necessitates information about a new constellation of market conditions to be acted upon, information that directs activities so that certain needs are economically satisfied, and finally information about whether the activities undertaken toward this end are succeeding. Without this information, coordination is impossible.

We have discussed how markets create both this information and the incentives to act upon it and how government, by its nature, cannot create either the information or the incentives. This condition has radical implications for disaster-management policy: Government must be removed from disaster management to the same extent that it is removed from all other successful market activities. This conclusion means that government's near-monopoly control of disaster relief and its role as a centralized "clearinghouse" of relief activities must be relinquished if disaster management is to be effective. Tinkering with government disaster management at the margins is no more likely to make government disaster relief effective than tinkering with the Soviet Union's centrally planned economy was likely to improve its effectiveness.

In government's place, the market should be allowed to coordinate relief activities, as it did to a limited extent following Hurricane Katrina despite government restrictions, when private for-profit and nonprofit actors were remark-

32. Aaron Davis, "FEMA Trailer Parks Subject to Criticism from All Sides," *San Jose Mercury News*, October 31, 2005.
33. "Katrina by the Numbers," *Shreveport Times*, August 27, 2006.
34. "What Went Wrong," interview.
35. Ibid.
36. Stephen Bainbridge, "The Invisible Helping Hand," *Tech Central Station*, September 8, 2005.

ably successful in relieving victims' plight, especially in those areas hit hardest. The private sector proved itself capable, as it does under "normal" circumstances, of generating the relevant information at each of the critical stages of disaster response. The public sector, in contrast, did not demonstrate effectiveness, again as in "normal" circumstances.

Our finding that an inability to overcome the information problem is the root cause of government's failure to manage natural-disaster relief effectively casts doubt on recent explanations of FEMA's failure following Hurricane Katrina. One strand of argument, for example, suggests that an unfortunate succession of "bad directors," culminating in Michael Brown, explains this failure. Our analysis suggests that although incompetent leadership may exacerbate government's inability to manage natural disasters effectively, it is of minor importance in comparison to Hayek's knowledge problem.

Even the most benevolent and effective director cannot overcome this problem, which stems intrinsically from centralized, governmental management. Thus, optimism about the future success of FEMA or of other possible agencies in providing disaster relief is unwarranted. The "bad directors" argument is analogous to the "bad rulers" argument some have used to explain the Soviet Union's failure. In the latter case, bad leadership contributed to the problem, but it did not create the system's core failure. Replacing Stalin with Mother Theresa or Albert Einstein would have been no more helpful for the Soviet economy than replacing Michael Brown or the current FEMA director with one of these individuals would be.

Likewise, our discussion casts doubt on the argument that FEMA's recent reorganization, under the Department of Homeland Security following 9/11 is responsible for its failure on the Gulf Coast. Again, although it is true that following this reorganization additional resources were channeled to fighting terrorism instead of, for example, rebuilding levees, the fundamental issue is why government directed resources to the specific uses it did (an information problem) instead of to alternative uses, given the substantial overlap between the ends involved in fighting domestic terrorism and preparing for natural disaster. A weak levee that, if destroyed, might wipe out an entire metropolitan area is both a natural-disaster concern and a terrorism concern, given such a target's clear vulnerability to attack.

Finally, our focus on the information problem calls into question arguments that FEMA per se is somehow to blame for government's failed response to Hurricane Katrina.

Photo: DOD/USN

The May 2006 report of the Senate Committee on Homeland Security and Governmental Affairs, for example, suggests abolishing FEMA and replacing it with an even larger government agency for disaster-relief management, to be called the National Preparedness and Response Authority. Such proposals misconstrue the root failure of government disaster management, which is informational in nature and inherent in government itself. Any government agency for disaster management will be subject to the same information failures as FEMA and thus cannot be relied on to prevent failures such as those that characterized government's response to Hurricane Katrina.

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