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Weathering Corruption

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Abstract

Could bad weather be responsible for U.S. corruption? Natural disasters create resource windfalls in the states they strike by triggering federally-provided natural disaster relief. Like windfalls created by the "natural resource curse" and foreign aid, disaster relief windfalls may also increase corruption. We investigate this hypothesis by exploring the effect of FEMA-provided disaster relief on public corruption. The results support our hypothesis. Each additional $1 per capita in average annual FEMA relief increases corruption nearly 2.5 percent in the average state. Eliminating FEMA disaster relief would reduce corruption more than 20 percent in the average state. Our findings suggest that notoriously corrupt regions of the United States, such as the Gulf Coast, are notoriously corrupt because natural disasters frequently strike them. They attract more disaster relief making them more corrupt.

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1 Introduction

Between 1990 and 2002 America convicted more than 10,000 public officials of corruption-related crimes. The distribution of corrupt politicians and bureaucrats, however, was far from even. America as a whole averaged four corruption-related convictions per 100,000 residents. Mississippi, Florida, and South Dakota averaged 7.5. Utah, Arizona, and Nebraska, on the other hand, had less than half the U.S. average.

Over the same period, 599 natural disasters struck America. Like with corruption, these too were unevenly distributed. Oddly, though, the geography of natural disasters maps the geography of corruption extremely well. 56 of these natural disasters occurred in Mississippi, Florida, and South Dakota. Only 13, however, occurred in Utah, Arizona, and Nebraska.

The positive connection between public corruption and natural disasters holds throughout America. Consider Figure 1, which plots the prevalence of natural disasters and public corruption for each of the 50 states. The relationship is clearly positive: states hit by more natural disasters are more corrupt.

What accounts for this peculiar relationship? It's as though some parts of America are cursed with bad weather and dirty politicians, while others are blessed with good weather and more scrupulous government officials. Could bad weather be responsible for corruption?

Strange though it may seem, indirectly, the answer may be yes. Bad weather by itself is unlikely to impact corruption. However, the windfall of federally-provided resources that follow bad weather is not so innocent.[1]

Recent work in development economics shows that resource windfalls generated by rich

[1] A growing body of research documents that FEMA-provided disaster relief often follows political concerns rather than humanitarian ones. See, for instance, Garrett and Sobel 2003; Sobel and Leeson 2006; Shughart 2006.

natural resource endowments or foreign aid intensify political struggles over control of the new resources. Djankov, Montalvo, and Reynal-Querol (2005), for instance, demonstrate that foreign aid results in the same rent-seeking activities documented in the literature that addresses the "natural resource curse." Important work by Ades and Di Tella (1999) and Leite and Weidmann (1999) shows that this rent-seeking often takes the form of corruption.

When the federal government supplies relief following a natural disaster it creates a resource windfall similar to natural resources or foreign aid. Disaster relief is therefore likely to create the same kind of rent-seeking activities that manifest in the form of corruption. Disaster relief windfalls open up new opportunities for bribery, for instance by privileging private vendors charged with administering post-disaster supplies in return for illegal side payments. Following flooding in Buchanan County, Virginia in 2002, for example, county officials embarked on a frenzy of bribe solicitation for reconstruction contracts, which ended in 16 indictments of public corruption. As the lead federal prosecutor of the case described it, "From Day One that FEMA money showed up, bribes were being taken" (quoted in Lakin 2004). Disaster relief windfalls also create new opportunities for public officials in charge of disaster relief funds to skim incoming resources for themselves or divert them to their friends. The chaotic and confused atmosphere typically created in the wake of a major natural disaster facilitates public officials' ability to do this.

The surge in disaster relief fraud and corruption after Hurricane Katrina illustrates this problem well. Since September 2005, Congress has approved $113 billion in disaster relief for Hurricanes Katrina and Rita, generating a multitude of new avenues for abuse. A new study by the Government Accountability Office (2006), for example, estimates that citizens fraudulently appropriated $1 billion, or nearly 19 percent, of the $5.4 billion in FEMA

"expedited assistance" after Hurricanes Katrina and Rita.

This windfall of resources fueled government corruption as well. In April 2006, for example, a federal court convicted two FEMA Disaster Assistance employees in Louisiana of taking bribes from a food supplier in return for falsely reporting the number of meals he provided. According to a recent Senate investigation, since August 2005, federal prosecutors have charged nearly 300 individuals with abusing FEMA relief, many of whom are public employees accused of soliciting bribes from relief-funded contractors (Yen 2006). In fact, post-Katrina public corruption has run so rampant that the FBI has set up a "Public Corruption and Government Fraud" hotline to help monitor FEMA relief-related political corruption.

This paper explores the effect of FEMA-provided disaster relief on public corruption. We find that each additional $1 per capita in average annual FEMA relief increases corruption nearly 2.5 percent in the average state. Eliminating FEMA disaster relief would reduce corruption more than 20 percent in the average state. Our findings suggest that notoriously corrupt regions of the United States, such as the Gulf Coast, are notoriously corrupt because natural disasters frequently strike them. Natural disasters create resource windfalls in the states they strike by triggering federally-provided natural disaster relief. Disaster relief windfalls in turn increase corruption.

2 Dirty Disasters

We define corruption as political officials' abuse of public authority for private gain. Glaeser and Goldin (2006) identify three main ways that political agents may do this. First, public

officials may directly steal public funds through embezzlement. Second, they may indirectly transfer government funds to private parties for their own gain. Bribes and kickbacks are good examples of this. A political agent in charge of contracting out a government service may, for instance, offer the contract to the party willing to offer him the largest side payment instead of the best provider. Finally, public officials may manipulate legal rules they are charged with enforcing for their personal benefit. A regulatory inspector, for example, may solicit or accept bribes from private individuals subject to regulatory inspection in return for his approval.

A substantial literature that deals with corruption documents the economic damage it creates. Shleifer and Vishny (1993) and Ehrlich and Lui (1999) provide theoretical accounts of how corruption inhibits economic performance. Mauro (1995) was the first to examine this connection empirically and found that higher corruption was associated with lower investment and economic growth. Subsequently, numerous papers examining the determinants and effects of corruption internationally have substantiated his findings (see, for instance, La Porta et al 1999 and Alesina, Baqir, and Easterly 2000; Treisman 2000). Most recently, important research by Glaeser and Saks (2006) confirm the results found in cross-country analyses for America.

Research by Svensson (2000) Leite and Weidmann (1999), and Djankov, Montalvo, and Reynal-Querol (2005) demonstrates that resource windfalls generated by natural resources and foreign aid set in motion rent-seeking activities that can lead to poor economic performance and increased concentration of political power. Ades and Di Tella (1999) and Leite and Weidmann (1999) show that resource windfalls from natural resources or aid also tend to increase public corruption. Resource windfalls increase rents to those in charge of the

new resources. This raises the value of controlling windfall resources, which in turn leads to greater corruption.

Natural disaster relief creates resource windfalls in essentially the same way that natural resources and foreign aid do. The President declares a natural disaster and FEMA relief flows to the affected area to aid those in need and reconstruct what the disaster destroyed, creating a windfall. This windfall creates new opportunities for political corruption. As Department of Homeland Security inspector general Richard Skinner put it, "after disasters, when you have this kind of money being pumped into the community this fast, there are going to be people who are going to try to take advantage of it" (quoted in Krolicki 2005).

Disaster relief windfalls create three new sources of rents political actors may appropriate through corruption. The first is new opportunities for embezzling public funds or in-kind resources earmarked for disaster relief. When FEMA responds to a natural disaster it deploys financial and physical resources to state and local government officials to assist disaster victims and clean up disaster-caused wreckage. This puts state and local government officials in a position to steal part of these resources for many projects where verifying how they used resources is difficult. In 2005, for example, an employee of Florida's Department of Health and Rehabilitative Services attempted to embezzle $48,000 in FEMA relief following a 1998 hurricane in Florida (Insurance Journal 2005). A number of hurricane victims have also accused public officials in Louisiana of stealing relief supplies intended for disaster victims after Hurricane Katrina (Rubinkam 2005).

Second, natural disaster relief windfalls enhance public officials' ability to transfer government funds to private individuals for their own gain. Following natural disasters, FEMA sends inspectors to disaster cites to identify damaged individuals and assess their needs for

government assistance. If private individuals and FEMA inspectors collude for mutual gain, it is difficult to detect corrupt transfers. For instance, a FEMA inspector may agree to overstate the damage the private individual incurred in return for a bribe. Where disasters are severe, in principle thousands of individuals qualify for FEMA assistance. This creates ample opportunity for this kind of corruption. In 1994, for example, federal prosecutors charged FEMA inspector Mark Verheyden for soliciting a $500 bribe and sexual favors in return for inflating a resident's disaster claim following a flood in Texas (O'Matz 2005).

Additionally, after disasters, affected locations inevitably require rebuilding. This generates new potential rent flows that public officials in charge of identifying contractors for this purpose may corruptly appropriate. Political agents with such authority have increased ability to make illicit agreements with contractors whereby they select contractors if the contractors agree to kickback some of their payment to political agents or benefit them in other ways. In 1997, for instance, FEMA provided $1.2 million in relief to Guam to replace bus shelters decimated by Super Typhoon Paka. The Governor of Guam's Chief of Staff illegally awarded the hefty contract to the Governor's primary business rival in return for the rival's support of the Governor in the 1998 gubernatorial campaign.

Third, natural disasters put public officials in charge of new and valuable non-financial resources, such as food, water and shelter, increasing their power to extort or solicit bribes. In 2003, for example, a FEMA employee plead guilty to stealing goods from a Transportation Logistics Center used for FEMA relief purposes (OIG 2004). In another case in 2003 federal prosecutors convicted two individuals in the U.S. Virgin Islands for accepting bribes and extorting payment from construction contractors employed under a FEMA-sponsored re-roofing program. In 2006, Louisiana police caught a FEMA contractor red-handed trying

to sell a stolen FEMA-supplied temporary housing trailer for victims of Hurricane Katrina on the black market (CNN 2006). Where public officials are not directly in charge of vital supplies, they are often in charge of selecting vendors who are. In this case, they are presented with additional opportunities for kickback arrangements in which they choose vendors who make them side payments along the lines discussed above.

In June 2006, for instance, a federal court indicted Adrian Brown, an Administrator of Bolivar County in Mississippi, for soliciting kickbacks in his capacity as an administrator of FEMA hurricane relief devoted to maintaining a website to assist displaced hurricane victims. The federal indictment against Brown also charged him with using intimidation and threats to coerce favorable testimony from witnesses in the grand jury trial that heard his corruption case (Gates 2006).

Key to public officials' enhanced ability to engage in corruption is the chaotic atmosphere that usually attends natural disasters. The devastation, incapacitation, and chaos inherent to severe natural disasters often leads to a situation in which the federal government drops resources on disaster-hit areas in times of crises and confusion. Frequently, it is unclear to federal relief overseers who is charge of what, which resources are going where, and how local public officials are supposed to use them.

The time-sensitive nature of many natural disasters puts a premium on getting resources to the disaster zone rather than on determining the specifics of resource use or monitoring their employment. Ensuring that recipients of disaster relief resources are accountable for how they used those funds is of subsidiary importance, and even then is typically so only after the disaster-related chaos had died down. In this environment it is more difficult to detect diversions of public funds, bribery, and other forms of political abuse, making it easier

and less risky for public officials to engage in corruption.[2]

In 1999, for example, the city of Grand Forks, North Dakota received $6.76 million in FEMA relief for a winter storm disaster. A subsequent audit by the Office of Inspector General, however, concluded that the municipality could not account for nearly ten percent of the relief it received, which city officials had in various ways misappropriated. A similar audit of the $2.26 million in FEMA-provided relief aid bestowed upon the City of Hoisington, Kansas for a tornado that struck it in 2001 found similar public misuses of FEMA relief, including relief funds that the city devoted to non-disaster related city projects. In both cases, the cities also ignored construction contract regulations, suggesting that reconstruction contracts were awarded corruptly.

In light of the enhanced capacity for corruption that disaster relief windfalls create, our model predicts a positive and significant effect of FEMA relief on public corruption. It does not, however, predict this for other types of government spending because they do not provide resource windfalls. State government spending, for instance, is a regular, continuous, and predictable flow of annual resource deployment. Rent-seeking activities have already created an equilibrium that predetermines the division of these resources. Additionally, for state spending, the relative closeness of the resource provider (state government) and resource recipients (state government officials) makes resource abuse less attractive, more difficult, and therefore less likely. There is consequently little reason to think that state spending would be significantly related to corruption. A possible exception to this might be if higher government spending in general is associated with additional regulation, which may create

[2] Adding to the likelihood of FEMA relief-related corruption is what some evidence suggests is an unusually large number of FEMA employees and subcontractors with histories of abuse and corruption. One investigation of 133 FEMA inspectors and managers found that 30 had criminal records (O'Matz 2005).

additional opportunities for corruption (see, for instance, Djankov et al 2002; Acemoglu and Verdier 2000). However, previous work that examines this hypothesis at the state level in the U.S. has found it lacking empirical support (Glaeser and Saks 2006).[3]

Federal transfers to states can create very small resource windfalls, as their flow can be somewhat more irregular and unpredictable. Additionally, the source of funds in this case (federal government) is more remote from fund recipients, who are state and local officials. Federal transfers are therefore more likely to be positively related to corruption. Fisman and Gatti (2002), for instance, find that higher federal spending in states is associated with higher corruption. However, in most cases states receive fairly constant and assured flows of resources from the federal government each year. Furthermore, because of the comparatively "normal" atmosphere in which these resources are transferred, federal oversight of non-disaster deployments tends to be considerably stronger than for disaster relief. Federal transfers to states are therefore more likely than state spending to impact corruption, but less likely than FEMA relief to do so. Our model thus predicts a possibly positive and more significant impact of federal spending on public corruption compared to state spending, however one that is substantially smaller than the effect of FEMA relief.

3 Data

We construct our corruption data from the Department of Justice's "Report to Congress on the Activities and Operations of the Public Integrity Section." We tabulate the total number of corruption-related crime convictions in each state between 1990 and 1999 and divide this

[3]Goel and Nelson (1998), however, find that higher state and local spending is associated with higher corruption.

by the number of years in our sample and each state's population in 1990 to derive the average annual corruption-related crime convictions per 100,000 residents for all 50 states.[4]

These data include all federal, state, and local public officials convicted of federal crimes related to corruption, as well as private citizens involved in what the DOJ defines as "public corruption offenses." Roughly half of all federal corruption-related convictions are federal employees. About a quarter are state and local employees, and the remaining quarter are private citizens.

Corruption-related crimes include those such as: theft from the government, embezzlement, or other abuse of government resources by a public official; bribery of or by a public official; extortion or other 'political shakedowns' by a public official; kickback payments to or from a public official; election-related crimes (such as vote fraud or campaign finance violations) by a public official; unlawful insider deals (such as negotiating a contract with a private vendor in whose firm the negotiator or his family have a financial interest) by a public official; and other violations of the federal criminal code by public officials in their capacity as agents of the government.

State-level corruption rates display considerable variation, ranging from 0.85 average annual corruption-related convictions per 100,000 residents in Louisiana, the most corrupt state in the country, to 0.07 average annual corruption-related convictions per 100,000 residents in New Hampshire, the least corrupt state. The average state in our sample has 0.31 annual corruption-related convictions per 100,000 residents, and this measure's standard deviation is 0.17.

[4] In a few cases, corruption data are not reported for various years in certain states. In these cases we calculate the state's average over the years for which data are reported.

Our corruption data correspond well to intuition about which states are the most corrupt and which states are the least. Louisiana, Mississippi, and Florida are among the most corrupt states. Nebraska, Colorado, and Utah are among the least corrupt states.

As noted in the Introduction, these data also correspond to intuition about which states tend to be hit hardest by natural disasters, and thus receive the most FEMA relief, and which do not. Natural disasters strike Louisiana, Mississippi, and Florida more often and severely because of their location in the hurricane-prone Gulf Coast. Nebraska, Colorado, and Utah, on the other hand, are located in the Western Great Plains, which suffers far fewer and less severe natural disasters because of its geography.

We get data for our variable of interest, FEMA disaster relief payments, from Garrett and Sobel (2003). These data identify FEMA relief received by state between 1990 and 1999. Based on these figures we compute the average annual per capita FEMA relief that each state receives. The mean annual FEMA relief per capita in our sample is $8.79. The three greatest FEMA relief recipients are North Dakota, California, and Hawaii. 125 major natural disasters struck these three states since 1953. The three smallest recipients are Utah, Wyoming and New Mexico. Only 33 natural disasters hit these three states over this period.

Our corruption measure has significant advantages over those used to measure corruption internationally. Because there is not state-level level data (and in a number of cases, no states to even produce such data) for most countries, the literature typically makes international corruption comparisons using indices of perceived corruption across nations. Perceived corruption is based on opinion surveys administered to citizens in various nations, which ask respondents to rank their beliefs about the level of corruption in different countries. Although this works reasonably well for cross-country comparisons, a direct, objective measure of cor-

ruption would be much preferred. More recent work, such as Svensson (2003) and McMillan and Zoido (2004), uses firm and individual-level survey data to explore questions about the magnitude of bribes firms must pay to corrupt political agents. However, as Glaeser and Saks (2006) point out, this data is unable to answer questions about the determinants of corruption within countries.

The state-level corruption data we use overcomes these problems. First, it is not based on surveys. The DOJ compiles conviction data from actual occurrences of public corruption. This provides us a direct and objective measure of corruption that is not subject to potential biases or flaws in individual perceptions. Additionally, the availability of conviction information sub-nationally allows us examine the determinants of American corruption by exploiting variation in corruption convictions between states.

We follow Glaeser and Saks (2006) in selecting the control variables for our analysis. Our data for these variables are from a number of sources. We obtain information related to state-level income, education, and demographics from the 1990 Census. We construct the share of each state's workers employed by government using the 1992 Census of Governments. This fraction includes all federal, state, and local public employees in the state. We use data on state governments' general direct expenditures per capita, excluding expenditures funded from federal sources, for 1999 from the U.S. Census Bureau's "State Government Finances." These data exclude all FEMA-related spending. Finally, we obtain data on non-FEMA related federal expenditures per capita in each state in 1999 from the Census Bureau's "Federal Aid to States" report.

4 FEMA Relief and Corruption

4.1 OLS Estimates

Figure 1 depicts the positive relationship between the number of natural disasters and public corruption in the 50 states. The number of natural disasters in a state proxies for the amount of FEMA disaster it receives, since states that are more frequently hit by natural disasters tend to receive more FEMA disaster relief. This relationship, however, does not control for the severity of natural disasters. A state that is hit by a larger number of smaller disasters will receive less FEMA relief than one that is hit by a smaller number of more severe disasters.

Therefore, a more direct way to examine our hypothesis graphically is to look at the relationship between corruption and FEMA relief itself. Figure 2 does this and illustrates the same pattern as Figure 1: states that receive more FEMA relief are more corrupt.

To isolate this relationship econometrically, our benchmark specification estimates the following equation using Ordinary Least Squares (OLS):

$$\text{Corruption}_i = \alpha + \beta \text{FEMA}_i + \mathbf{Z}_i\gamma + \varepsilon_i \tag{1}$$

where Corruption_i is the average annual number of corruption-related crime convictions in state i per 100,000 residents for the period 1990-1999; β is our coefficient of interest, which measures the effect of average annual FEMA-provided disaster relief per capita (1990-1999) on public corruption, and $\mathbf{Z}_i$ is a vector of control variables that include: log median household income, the share of each state's workers employed by government, the share of the population age 25 and over with a high-school degree or less, and log population. Our

data for all control variables are for 1990.

Table 1 presents the results of our OLS estimates. Column 1 contains our most basic specification. Our model does a good job of predicting public corruption across the states. The coefficients on our variables are sensible and consistent with other studies that consider the determinants of U.S. corruption. Income and population have essentially no effect on corruption. Less education and a larger share of government employees, on the other hand, are associated with more corruption.

What about FEMA disaster relief? In our stripped-down specification, FEMA relief has a positive and highly significant association with public corruption. A \$1 per capita increase in average annual FEMA disaster relief results in a $(0.55/0.31 \approx)$ 1.8 percent increase in corruption for the average state. Stated differently, going from a state that has experienced no natural disasters and thus received no FEMA relief to the average state, which is hit by approximately nine official natural disasters annually and receives \$8.79 per capita in FEMA relief per year, is associated with a $(1.8 \times 8.79 \approx)$ 15.6 percent increase in corruption.

In column 2, we try controlling for some additional variables that might affect corruption to see if the relationship between FEMA relief and public corruption is robust. Here, we control for: income inequality in each state using its gini coefficient, non-FEMA related state discretionary spending per capita, non-FEMA related federal spending in the state per capita, and racial fractionalization.[5] To construct this last variable we compute an index of state-level racial fractionalization defined as: $1 - \sum S_i^2$, where S_i is the population share of group i. We use population shares for the following groups: Black, White, Native American, Asian, and all others. Finally, we include a measure of how each state's legal environment treats

[5] We try controlling for racial shares separately as well. Doing so does not effect our estimates.

public corruption. For this variable we use the Better Government Association's integrity index, which scores states on the strength of their laws against public sector corruption.

The coefficients on our new variables are reasonable. Greater income inequality and racial fractionalization increase public corruption (though the latter not significantly), while stronger state laws against corruption decrease it. The impact of FEMA relief, however, grows even stronger. Here, an additional $1 per capita in average annual FEMA relief is associated with a 1.9 percent increase in public corruption in the average state. Alternatively, moving from a state that has experienced no natural disasters and received no FEMA relief to the average state in our sample increases public corruption 17 percent.

Notably, this is not true for other types of government spending. Non-FEMA related state discretionary spending is insignificant, negative, and nearly zero. Non-FEMA related federal spending is positive but insignificant and also extremely small. Thus, consistent with our model's prediction, FEMA relief, which produces the greatest resource windfalls, positively and significantly impacts corruption, whereas federal transfers effect corruption positively but not significantly, and state spending not at all.

In column 3 we perform one final check of our OLS estimates to ensure the robustness of FEMA relief's impact on corruption. We add regional dummies to see if geography is driving our results. It is not. The importance of FEMA disaster relief and unimportance of other types of government spending remain unchanged. The coefficient on FEMA relief is nearly identical and remains significant at the one percent level. Here, moving from a state without natural disasters to the average state, which receives $8.79 per capita in FEMA relief annually, increases corruption 16.4 percent. In contrast, both non-FEMA related state discretionary spending and federal spending are insignificant. Only FEMA relief impacts

public corruption.

4.2 IV Estimates

In principle, endogeneity could be influencing our OLS estimates. It is possible that in states that have more corrupt politicians and bureaucrats, public officials are better at attracting more FEMA relief resources in the first place. In other words, the direction of causation may flow from greater corruption to higher FEMA relief in addition to flowing from higher FEMA relief to greater corruption.

We correct for this problem by instrumenting FEMA relief with private insurance property claims from natural disasters. Private insurance claims from natural disasters are a good instrument because they are highly correlated with FEMA relief but pubic corruption does not influence them. Unlike FEMA relief, public officials play no role in determining private insurance claims. Private insurance companies exclusively determine damages, which are a function of natural disaster severity. Unless political officials can control the weather, they cannot affect them. Our Two-Stage Least Squares (2SLS) estimations use the following first-stage equation to instrument FEMA_i in (1):

$$\text{FEMA}_i = \alpha + \nu \text{Insurance Property Claims}_i + \mathbf{X}_i\gamma + \varepsilon_i \tag{2}$$

where FEMA_i is average annual FEMA disaster relief per capita in state i between 1990 and 1999, $\text{Insurance Property Claims}_i$ measures average annual private insurance property claims from natural disasters per capita in state i between 1990 and 1999, and $\mathbf{X}_i$ is a vector of covariates that affect all variables. The exclusion restriction is that Insurance Property

Claims_i does appear in (1).

Panel A in Table 2 contains the results of our second-stage estimations. First, we reestimate the specification that includes our additional control variables in column 2 of Table 1. Our results here suggest that the OLS estimates do in fact suffer from endogeneity, but in the opposite direction. Our OLS estimates understate rather than overstate the impact of FEMA relief on public corruption. When we instrument for FEMA disaster relief, its positive effect on corruption not only remains highly significant, but increases substantially.

In column 1, a $1 increase in average annual FEMA relief per capita results in a 2.5 percent increase in the average state's corruption. Stated differently, moving from a state that has experienced no natural disasters and thus received no FEMA relief to the average state increases corruption nearly 22 percent.

The pattern for other kinds of government spending is the same as in Table 1. Non-FEMA related state discretionary spending has no relationship to corruption, and non-FEMA related federal spending has a positive relationship, though one that is nearly zero. A $1 increase in average annual federal spending per capita only increases the average state's corruption 0.068 percent.

Column 2 uses the specification from column 3 of Table 1, which controls for geographic region. The stronger effect of FEMA relief on corruption identified using an instrument for FEMA relief does not change. FEMA disaster relief remains highly significant, and moving from a state with no natural disasters to the average state is associated with a 20.7 percent increase in corruption. The effect of state discretionary spending is still negative and insignificant. Federal spending loses significance and remains tiny compared to FEMA relief. A $1 increase in average annual FEMA relief per capita increases the average state's

corruption 2.4 percent. A $1 increase in average annual federal spending per capita increases its corruption only 0.065 percent.

5 Concluding Remarks

Is bad weather responsible for U.S. corruption? Our results indicate that indirectly at least, the answer may be yes. States that experience more frequent and severe natural disasters attract larger quantities of FEMA disaster relief. This relief creates a resource windfall that increases public corruption. Our findings suggest that every additional $1 per capita in average annual FEMA relief increases corruption nearly 2.5 percent in the average state.

One interesting implication of these results is what they suggest about why some states, like Louisiana and Mississippi, have long and notorious histories of corruption, while others, such as Nebraska and Colorado, do not. Louisiana and Mississippi's disadvantageous location in the Gulf Coast where hurricanes and other bad weather are commonplace may be a large part of the reason why they have historically been more corrupt than states in the Great Plains. In this sense, geography may play an important role in determining corruption in America.

The policy implications of our analysis are straightforward. Although policy cannot do much to change the unlucky location of some states, it can impact the channel through which location affects public corruption: FEMA disaster relief. According to our estimates, reducing FEMA disaster relief would measurably reduce corruption. Eliminating FEMA disaster relief would decrease corruption more than 20 percent in the average state.[6] Additionally,

[6] For a discussion of how fully-privatized disaster relief would work, see Sobel and Leeson (2006).

our analysis finds some support for the effectiveness of more stringent laws punishing government corruption. Although the impact of strengthening such laws may help reduce public corruption, our findings suggest that they are less effective than curtailing FEMA disaster relief.

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Figure 1. Natural Disasters and Corruption

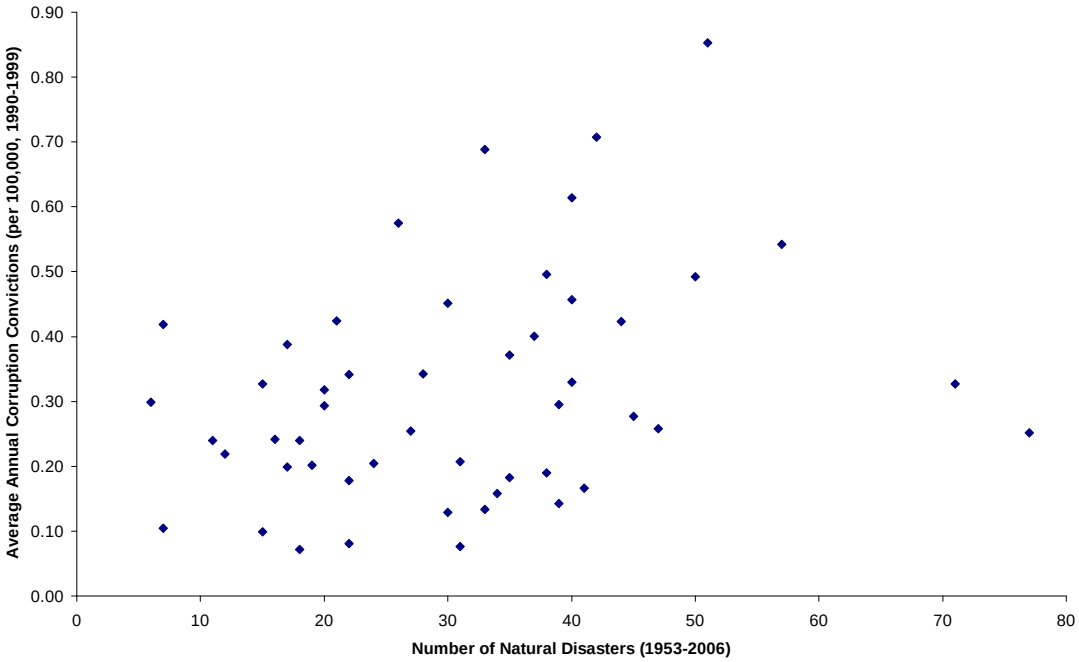

Figure 2. FEMA Relief and Corruption

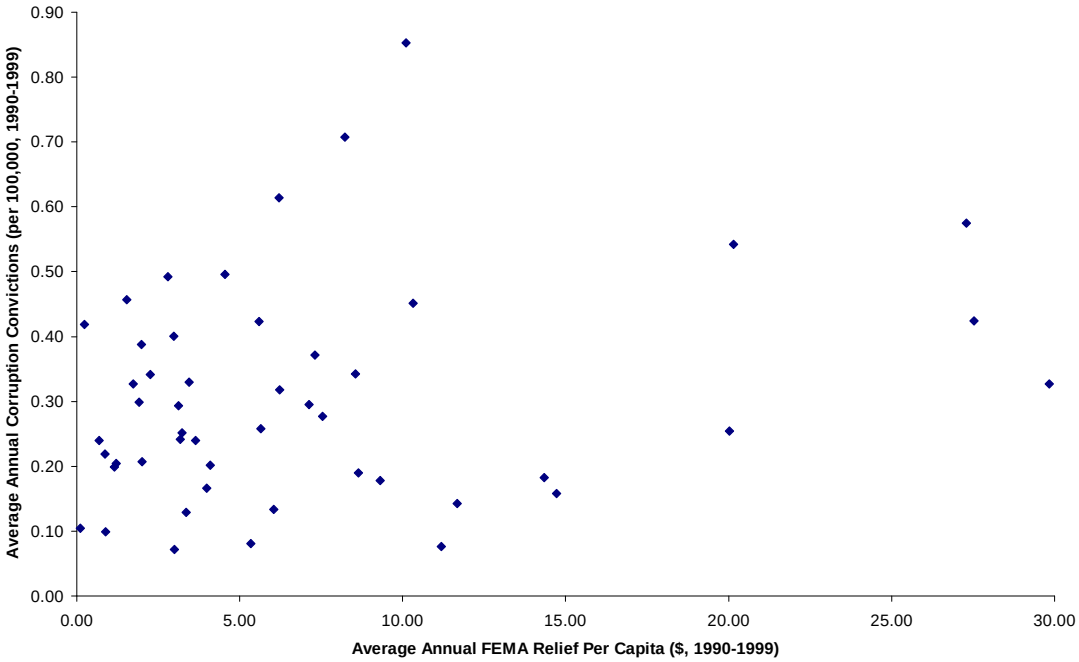

Table 1. FEMA Relief and Corruption: OLS Estimates

	1	2	3
FEMA	0.55***	0.60***	0.58***
	(0.15)	(0.079)	(0.095)
Log income	0.016	0.31*	0.27
	(0.15)	(0.18)	(0.25)
Share government employees	2.39**	1.17	1.31
	(0.95)	(1.24)	(1.27)
Education	0.011**	0.0091***	0.0090**
	(0.0041)	(0.0027)	(0.0042)
Log population	0.037	-0.023	-0.026
	(0.022)	(0.026)	(0.026)
Gini		3.44**	3.48**
		(1.50)	(1.60)
Fractionalization		0.12	0.18
		(0.21)	(0.26)
Non-FEMA state spending		-0.0060	-0.0057
		(0.0038)	(0.0040)
Non-FEMA federal spending		0.013	0.011
		(0.0083)	(0.0094)
Integrity		-0.0025*	-0.0023*
		(0.0012)	(0.0012)
Northeast			0.019
			(0.065)
Midwest			0.019
			(0.65)
South			-0.017
			(0.058)
Number of observations	50	50	50
R-squared	0.40	0.56	0.56

Table 2. FEMA Relief and Corruption: IV Estimates

	1	2
	Panel A: Second Stage of 2SLS	
FEMA	0.77**	0.73*
	(0.34)	(0.38)
Log income	0.14	0.019
	(0.21)	(0.27)
Share government employees	-0.0036	0.10
	(1.48)	(1.50)
Education	0.0074**	0.0040
	(0.0032)	(0.0055)
Log population	-0.020	-0.019
	(0.027)	(0.028)
Gini	2.92*	2.57
	(1.54)	(1.74)
Fractionalization	0.26	0.34
	(0.21)	(0.25)
Non-FEMA state spending	-0.0042	-0.0036
	(0.0042)	(0.0042)
Non-FEMA federal spending	0.021**	0.020*
	(0.0090)	(0.010)
Integrity	-0.0031**	-0.0029**
	(0.0012)	(0.0012)
Northeast		0.078
		(0.076)
Midwest		0.050
		(0.087)
South		0.048
		(0.074)
Number of observations	50	50
R-squared	0.45	0.46
	Panel B: First Stage of 2SLS	
Insurance property claims	16.90***	
	(5.73)	
Northeast	-3.61	
	(5.56)	
Midwest	6.17	
	(5.13)	
South	-3.93	
	(4.86)	
Number of observations	50	
R-squared	0.23	