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Hidden Financial Devastation Followed Hurricane Harvey

KEY TAKEAWAYS

- Prior research has shown that hurricane victims suffer short-term and relatively minor financial stress from flooding.
- However, breaking down data revealed that some of Hurricane Harvey's victims suffered persistent financial stress.
- Victims in parts of Houston with little expectation of flooding and who were in weak financial positions right before the hurricane were the most negatively affected.



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Since 2004, coastal communities across the U.S. have experienced some of the most devastating hurricane seasons on record.

Research has told us that flooding victims quickly overcome the relatively minor financial hardship caused by hurricanes. But reporters on the scene have detailed the long-term money struggles such families face.

Which version is right? We analyzed data on Hurricane Harvey victims' finances and found that the flooding *did* take a heavy toll—but only on some households.

The persistent financial stress from the 2017 hurricane in Houston, Texas, was concentrated among homeowners who were in weak financial positions right before the hurricane. That stress was amplified in areas that weren't expected to flood, meaning residents were less likely to have purchased flood insurance.

Hurricanes Affect Families' Financial Positions

Viewed from a household finances perspective, hurricanes can:

- damage or completely destroy assets such as homes, cars and other personal property;
- halt income via temporary or permanent job loss; and
- disrupt the repayment of debts as families attempt to recover from the storm.

Our study examined the effect that Hurricane Harvey had on household debts in the form of bankruptcy, overall delinquency, and mortgage balances.¹

Unlike previous research on flooding events, ours homed in on how flooding affects different types of people: those with more—or fewer—resources to confront the aftermath.

Hurricane Harvey: A Tempest like No Other

Hurricane Harvey made landfall as a Category 4 hurricane on Aug. 25, 2017. It stalled over the Houston area, dumping the largest amount of rainwater (51.88 inches) ever recorded in the continental U.S. from a single storm. Harvey was unique even among catastrophic storms (say, Hurricane Katrina in New Orleans) given several factors.

1. Unanticipated Flooding

Much of the flooding in Houston was unanticipated, and only 17% of homes had flood insurance. By comparison, over 90% of the blocks most flooded by Katrina were in a designated floodplain, and if homes in them were under mortgage, owners were required to have flood insurance.²

2. Financial Status of Victims

Harvey was fairly indiscriminate along racial, income and education lines in its effects on people. If anything, consumers in the most flooded blocks were typically more affluent, according to several measures (income, home values, credit access). That is unusual, given that greater financial means help insulate households from risk (e.g., by allowing people to purchase homes at higher elevations).

3. Migration and Effects on the Houston Economy

Despite Harvey's destruction, it did not generate substantial out-migration or wreck the Houston economy. In fact, Houston had net in-migration in the year after Harvey.

In practical terms, what this means for an analysis of the financial outcomes of Hurricane Harvey victims is that we can hold constant the economic environment faced by victims and better isolate the financial toll of flooding.

Victims' Financial Positions before Flooding

The previous research on mass flooding concludes that these events impose relatively minor and short-lived financial hardship on victims.³ This conclusion diverges sharply from that drawn from anecdotal, on the ground reporting, which tends to recount stories of lasting devastation inflicted upon families.

We aimed to reconcile these seemingly inconsistent descriptions of flooding's toll by analyzing a sample of Houston residents split by initial financial condition, as well as the likelihood they had flood insurance. By separating our sample along these dimensions, we can evaluate the effect of Harvey's flooding on those who have more—or fewer—resources to absorb the shock to household finances. Doing so reveals substantial differences in outcomes.

We sorted individuals (and census blocks, small geographic areas defined by the U.S. Census Bureau) based on financial constraints as defined by four indicators of limited access to credit and resources. The indicators are an individual's Equifax Risk Score (similar to a FICO credit score) and credit card utilization, and the median income and share of minority residents within the census block where the individual lived in the quarter that preceded Harvey's landfall.

The first two variables are intended to measure the individual's access to credit, whereas the latter two variables are intended to capture access to outside resources.⁴ We divided the sample into above- and

below-median levels of constraint (effectively, unconstrained and constrained).

Flood Insurance and Other Assistance

Flood insurance is the most significant form of assistance available for rebuilding after a catastrophic flood. To capture the likelihood of a household having held flood insurance, we separated households according to floodplain status: Lenders usually require flood insurance coverage for mortgaged homes within a 100-year floodplain.

Beyond flood insurance, there are three sources of assistance for households impacted by a storm: Federal Emergency Management Agency (FEMA) grants, Small Business Administration (SBA) disaster loans and Internal Revenue Service (IRS) disaster refunds. These programs are all designed to avoid duplicating the benefits of flood insurance. Recent work has shown that factors such as a low credit score or low income can lead to significant inequality in the receipt of loans to finance recovery.⁵

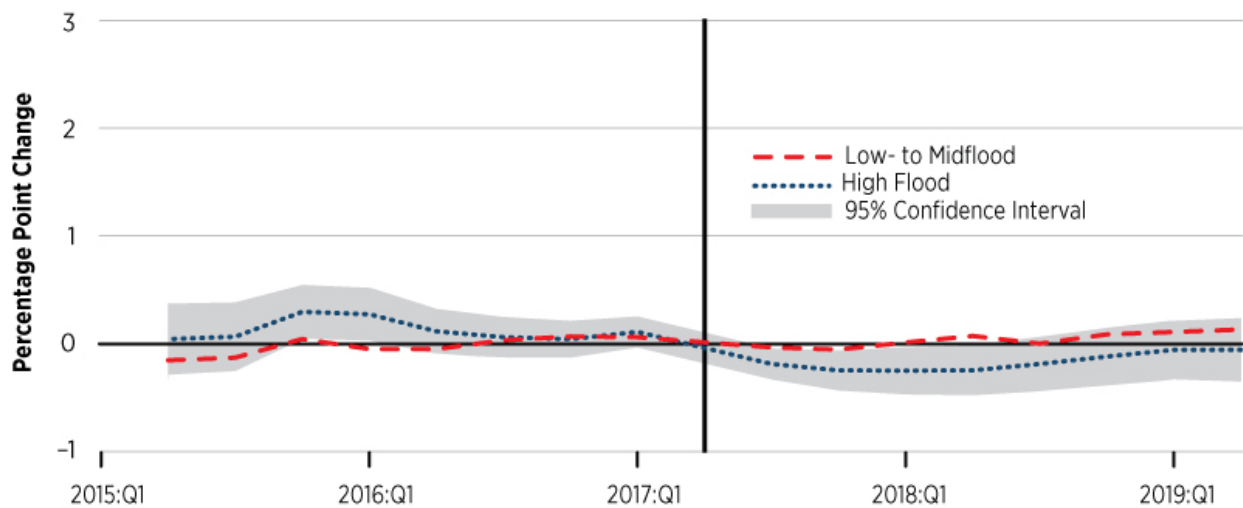
Within presidential disaster declaration areas, some types of lenders offer temporary forbearance for all local borrowing (i.e., a pause in loan payments). That means that the effect of flooding on delinquency will be muted. However, forbearance is temporary and even the most generous aid can be insufficient to cover all the disaster-related expenses. Thus, flooding can push borrowers on the cusp of bankruptcy into bankruptcy. So if flooding increases financial stress, we would expect to see an immediate and lasting jump in the share of a census block's residents with a bankruptcy event reported on their credit file.

Testing for Financial Distress

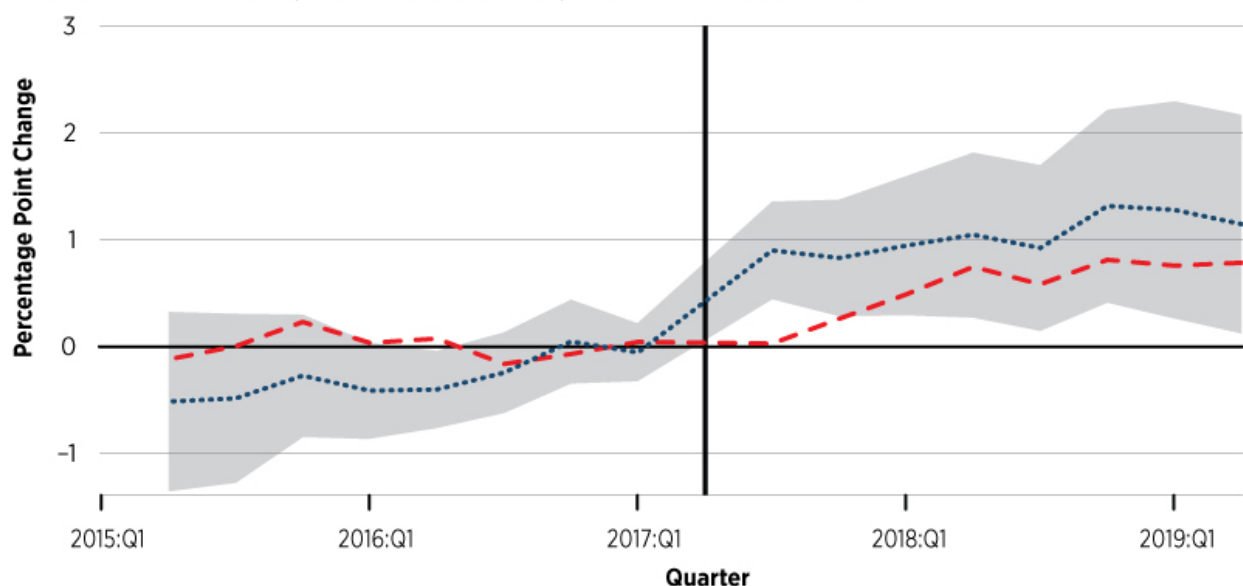
The figure shows our results at the census block level for high owner-occupied areas outside a floodplain. The "high flood" (deepest flood waters over the developed land) group captures the effect of being in the top third of flooded blocks relative to blocks that did not flood, and relative to the last quarterly observation before Hurricane Harvey (the first quarter of 2017).

Bankruptcy Rate Changes Vary According to Household Finances

Panel A: Unconstrained, outside floodplain, high owner-occupied



Panel B: Constrained, outside floodplain, high owner-occupied



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SOURCE: Federal Reserve Bank of New York/Equifax Consumer Credit Panel.

NOTES: Bankruptcy rate is the share of a block's residents that have a bankruptcy reported on their credit report during the quarter. The sample is split according to the share of residents classified as "constrained" or "unconstrained" as of the last quarterly observation before Hurricane Harvey (2017:Q2). The sample is further split by floodplain status. Results are weighted by the number of observations within each census block, effectively giving more weight to more precise observations. Shaded areas show confidence intervals: By sampling the same population many times and measuring the effect of the hurricane, 95% of the time the true effect would be captured in this interval. To avoid clutter, confidence intervals are only included for the most flooded group.

DESCRIPTION: Two line charts, Panel A and Panel B, show the effects of Hurricane Harvey on areas outside the floodplain with high shares of owner-occupied homes. Panel B has data on census blocks with a larger share of financially constrained homeowners than Panel A. The Panel B flood victims saw a

larger relative increase in their bankruptcy rate, peaking at about 1.3 percentage points for the most flooded areas.

Consistent with prior research that suggested natural disasters had a limited effect on financial distress, we found the bankruptcy rate didn't increase in the average Houston block. This result, however, masks substantial variation. The different effects are most apparent when the sample is limited to those census blocks that have more owner-occupied housing and are situated outside the flood plain (i.e., where residents may have been less insured against flooding).

In Panels A and B, the sample is further split according to whether the census block had fewer and more residents classified as financially constrained, respectively. The financially constrained blocks see a large relative increase in their bankruptcy rate. The effect peaks at about 1.3 percentage points and persists throughout the period following the hurricane. This effect size represents a 30% increase over the pre-Harvey bankruptcy rate in these same blocks.

Harvey Led to More Bankruptcies in Some Houston Areas but Not Others

These results point to a large relative increase in the bankruptcy rate in areas of Houston that unexpectedly flooded and where homeowners entered the storm in a worse financial position than other Houstonians.

Interestingly, the bankruptcy rate does not rise (relative to unflooded blocks) and, in some cases, even decreases slightly, in areas:

- with more renters;
- where the flooding was expected; and/or
- where homeowners were more financially secure.

Thus, these results offer a first indication of the importance of considering the concealed effects of natural disasters.

Our results must be interpreted as *relative effects*, not absolute effects, of Harvey on the bankruptcy rate. The average bankruptcy rate, even in flooded areas, continued its downward trend after Harvey, consistent with an improving local and national economy. In other words, absent the effect of Harvey, the bankruptcy rate would have fallen *faster* in the hardest hit areas than it actually did.

Hurricane Harvey was a historic storm which flooded households across the socioeconomic spectrum. Differences in financial resilience, coupled with an uneven landscape of federal aid, led to different recoveries (or lack thereof) for families.

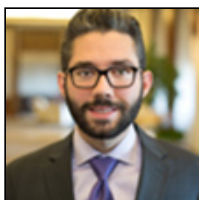
Stories of financial hardship are masked in the data until the sample can be winnowed by residents' initial financial constraints, homeownership status and whether they were likely to have flood insurance. Our study shows the importance of these initial conditions and how much they can alter hurricanes' financial effects on families.

Endnotes

1. See Billings, Stephen B.; Gallagher, Emily A.; and Ricketts, Lowell R. "Let the Rich Be Flooded: The Unequal Impact of Hurricane Harvey on Household Debt." Center for Household Financial Stability Working Paper, Feb. 11, 2020.

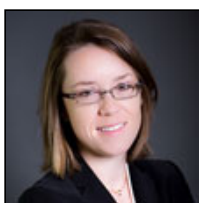
2. See Gallagher, Justin; and Hartley, Daniel. "Household Finance after a Natural Disaster: The Case of Hurricane Katrina." *American Economic Journal: Economic Policy*, August 2017, Vol. 9, No. 3, pp. 199-228. (Justin Gallagher is not related to article author Emily Gallagher.)
3. See Gallagher and Hartley, 2017.
4. The typical black and Hispanic families in 2016 had 10 cents and 13 cents to the dollar of wealth of the typical white family, respectively. See Kent, Ana; Ricketts, Lowell; and Boshara, Ray. "What Wealth Inequality in America Looks Like: Key Facts & Figures." St. Louis Fed's *Open Vault*, Aug. 14, 2019.
5. See Begley, Taylor A.; Gurun, Umit; Purnanandam, Amiyatosh; and Weagley, Daniel. "Disaster Lending: 'Fair' Prices, but 'Unfair' Access." 2018, working paper; and Gallagher, Justin; Hartley, Daniel; and Rohlin, Shawn. "Weathering an Unexpected Financial Shock: The Role of Cash Grants on Household Finance and Business Survival." Working paper, Aug. 31, 2018.

ABOUT THE AUTHORS



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