Financing Negative Shocks: Evidence from Hurricane Harvey
Collier, Powell, Ragin, and You

Internet Appendix

Survey Methods

Survey distribution

We distributed the survey using several channels to maximize total responses. Our primary distribution method was a letter mailed to a random sample of 5,000 businesses, which included a description of our survey and a $2 bill as a "thank you" for considering participating in our study. The random sample was stratified by the number of small- and medium-sized businesses reported in each county by the U.S. Census Bureau's County Business Patterns database. This random sample of business addresses was collected from the *ReferenceUSA* database, and few letters were returned as undeliverable. The letter included a simple URL link to the survey, which tagged each respondent as coming from the letter-writing campaign. The letters resulted in 171 survey responses.

Our second method of distribution was to partner with local business organizations, such as chambers of commerce and cultural associations, to email their members with links to our online survey. Contacts in the Houston and Lower Rio Grande Valley district offices of the Small Business Association (SBA) provided a list of 55 locally-active business organizations and made initial introductions. We also hosted a post-Harvey roundtable for business organizations at the Houston Small Business Development Center (SBDC) in July 2018, and made some additional contacts at that event. We provided these organizations with email templates to send to their members, as well as shortened templates to post on social media. We provided both English and Spanish versions of the email and social media templates. These templates included a unique

survey URL for each organization, which allowed us to connect each survey response to its distribution source. We asked 72 organizations to distribute the survey, and received a total of 181 usable survey responses from members of 17 of those organizations.

Finally, we received some ad-hoc responses to the survey in unique cases. First, a helpful business owner asked to distribute our survey link to her contacts, and we provided her with a unique URL to do so, resulting in 18 responses. We also received seven responses from a URL shared directly by our SBA contacts. In total for all distribution methods, we received 377 usable responses, 303 of which were 100% complete and 56 of which were less than 50% complete.[30]

We opened the survey to responses on August 24, 2018, which coincided with the one-year anniversary of Hurricane Harvey in Southeast Texas. We sent the email template to our business organization partners on the same day; many of them included our link in their weekly or monthly email newsletter to members. We followed up with our partners in late September and asked them to send a reminder to their members. Our letter was mailed to businesses in early November 2018.

Survey design

The first page of the survey included general instructions and guidance. Specifically, we asked subjects to respond with their best estimate or memory and noted that we are not asking them to review their records. We provided some informed consent information and a link for more details. On this first page, we also asked whether the respondent was responsible for making

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[30]There were a total of 430 responses to our survey. We dropped 37 responses which were missing the business name and address, and dropped sixteen which were duplicate responses from the same business. In most cases, these duplicates appeared to be respondents who did not finish their first response and re-started the survey later.

insurance decisions and when the business was established. The remainder of the survey comprised eight major sections. We randomized the order of certain sections as long as the randomization did not make the survey confusing. Respondents always began with *Business Demographics*, which requested the firm's name, current address, industry, number of locations, prior flood experience, and some questions on business philosophy.[31]

Following the general business demographics, subjects completed the *Pre-Harvey Financials* section. These questions asked about the financial status of the firm as of June 30, 2017. We asked how business was (five multiple-choice answers, from "Terrible" to "Excellent"), whether the business operated at a profit, break-even, or a loss, and for the number of full-time (30+ hours/week) and part-time (<30 hours/week) employees. After *Pre-Harvey Financials*, we randomized the order of certain sections. We list the remaining sections in a logical order for clarity.

The *Pre-Harvey Risk Management* section asked respondents about the risk management practices they had in place on June 30, 2017. We did not expect respondents to know specifics of their insurance contracts, so we asked for the proportion of assets insured against wind and flood—None, Some insured (under 50%), Most insured (at least 50%), and All insured (100%). For those who had wind and/or flood insurance, we asked whether the policy included coverage for business interruption (which we summarized as coverage for "lost profits while your business is closed due to damage," with an external link to an article by the Insurance Information

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[31]To reduce attrition, none of the survey questions were required—the respondent could continue without answering. We are able to identify questions that were seen but not answered. When feasible, we included an "Unsure" option and/or an "Other" option with a text input box to provide alternative responses.
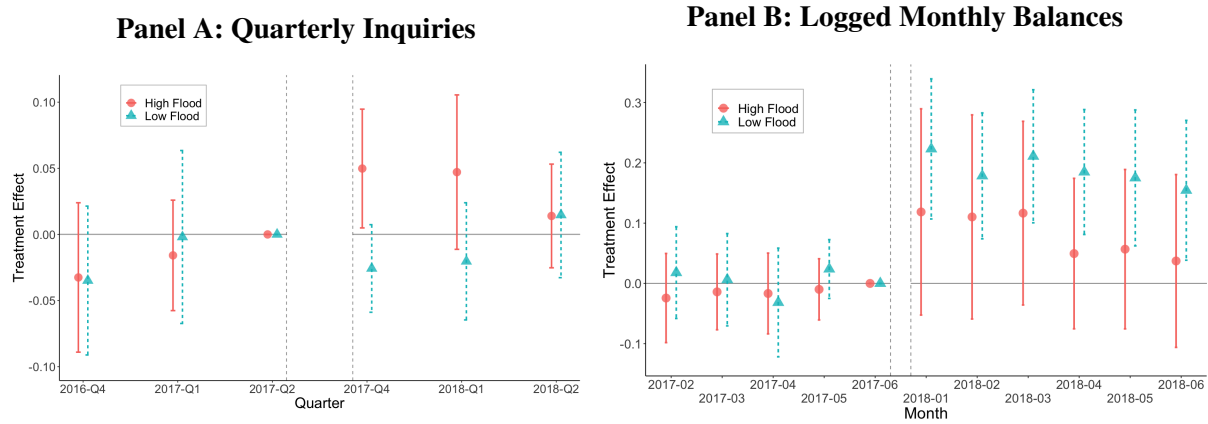
Institute). We also asked about non-insurance risk management, specifically whether the business had a written emergency response plan, cash reserves (i.e., a "rainy day" fund), or an "emergency" business credit card or line of credit.

In the *Harvey Effects* section, we first asked about the types of damage or disruptions potentially caused by Harvey, such as flood damage, wind damage, temporary or permanent closure, utility outages, decreased customer demand, etc. We then asked whether overall effect of Harvey was positive, negative, or neutral. For positively affected businesses, we asked for specifics about the positive effects (e.g., new revenue, competitors negatively affected, other, etc.).

We asked the same employee and profitability questions as pre-Harvey in the *Post-Harvey Financials* section. In addition, we asked respondents how their firm addressed financial needs (if any) resulting from Hurricane Harvey. Our financing options included business cash flow, business credit, personal resources (e.g., personal savings/credit, friends/family), insurance payments, SBA disaster assistance loans, other government assistance, nonprofit loans/grants, and crowd funding. We also asked a number of questions about applying for and approvals/denials of SBA disaster assistance loans, and the timing of any disaster loan funds. Finally, we asked respondents to judge whether the business had "fully recovered" from Harvey, and how long the recovery took (or how much longer they expect, if the business hadn't fully recovered).

Additional Tables and Figures for Section III

FIGURE A.6

Studied Firms in Disaster Area: Flood vs. Non-Flooded

Note: Major Disaster Declaration DR-4332-TX designated 41 counties to receive federal aid (FEMA, 2017b) for Hurricane Harvey. We refer to these counties as the "disaster area" (yellow area). We divide flooded firms into two groups based on the flood depth at their location estimated by FEMA ("Flood Depth"; FEMA, 2018). The low flood group includes firms in areas flooded 2.05 feet or less. The high flood group includes firms in areas with over 2.05 feet of flooding.

FIGURE A.7

Evolution in Inquiries and Balances, Full Sample

Panel A: Quarterly Inquiries

Panel B: Logged Monthly Balances

Note: Figure provides general support for the parallel trends assumption. None of the pre-Harvey coefficients are significantly different from zero. The figure plots 95% confidence interval of event study coefficients of inquiries (Panel A) and logged monthly credit balances (Panel B) on the high and low flood depths. The coefficients capture the average change in credit outcomes relative to Q2/June 2017 as a function of flood severity, compared to those outside the disaster area. The vertical, dashed lines mark the period during which we do not observe quarterly inquiries or monthly balances. Harvey occurred during that period.

TABLE A.10

Pre- and Post-Harvey Trends: Small Business Activities

	Establishments				
	(1) Total Number	(2) Entry Rate	(3) Exit Rate	(4) Death Rate	(5) Employment
I(DISASTERAREA) ×					
I(3YRPRIOR)	−5,635.437	0.002	−0.002	0.001	−8,157.552
	(6,495.471)	(0.004)	(0.004)	(0.004)	(11,621.600)
I(2YRPRIOR)	−5,737.841	0.0005	−0.003	−0.002	−8,224.540
	(6,383.254)	(0.004)	(0.004)	(0.003)	(11,493.360)
I(1YRPRIOR)	−6,503.211	−0.002	0.007	0.003	−10,004.510
	(6,381.108)	(0.004)	(0.005)	(0.003)	(11,490.950)
I(1YRAFTER)	−4,728.666	0.003	0.003	0.002	−10,656.360
	(6,217.161)	(0.004)	(0.007)	(0.005)	(11,470.240)
I(2YRSAFTER)	−3,726.054	0.011***	0.003	0.003	−10,378.040
	(6,446.825)	(0.004)	(0.004)	(0.003)	(11,469.410)
State-MSA FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Cluster by State-MSA	Yes	Yes	Yes	Yes	Yes
N	4,794	4,794	4,794	4,794	4,794
Adjusted R^2	0.577	0.644	0.405	0.371	0.529

Note: Table presents county-level analysis of small business activities following Hurricane Harvey on counties we draw from for credit report analysis. "Exit" describes the closure of a single establishment; "death" describes the closure of a firm and all of its establishments. We estimate:

$$y_{jt} = \gamma_0 + \sum_t \gamma_{1t} I_t(\text{YEAR}) \times I_j(\text{DISASTERAREA})$$

$$+ \sum_t \gamma_{2t} I_t(\text{YEAR}) \times I_j(\text{NOTDISASTERAREA}) + \text{FE}_m + \text{FE}_t + \varepsilon_{jt}.$$

where j indexes counties and t indexes year. March 2017 serves as reference period. The models include year fixed effects and state-MSA fixed effects. Disaster area represents being one of the 41 counties that were eligible for federal aid in the presidential disaster declaration DR-4332-TX for Hurricane Harvey (FEMA, 2017b). Regressions report robust standard errors clustered by state-MSA. Data are from Business Dynamics Statistics and Nonemployer Statistics of the U.S. Census Bureau (2018a; 2018b). The data include sole proprietors with no paid employees and establishments of firms with fewer than 500 employees. Stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

Share of Balances that are Impaired, Full Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I(POSTHARVEY) ×								
I(NOFLOOD)	0.012**	0.013*	0.012**	0.012**	0.026***	0.026***	0.014**	0.030***
	(0.006)	(0.007)	(0.006)	(0.005)	(0.007)	(0.007)	(0.007)	(0.007)
I(LOWFLOOD)	0.021***	0.024***	0.021***	0.022***	0.036***			
	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)			
I(HIGHFLOOD)	0.028***	0.024***	0.028***	0.027***	0.041***			
	(0.007)	(0.008)	(0.007)	(0.007)	(0.009)			
I(FLOODED)						0.038***		
						(0.008)		
ln(FLOODDEPTH)							0.023***	
							(0.006)	
I(FLOODED_REMOTE)								0.033***
								(0.009)
I(TX)					−0.023***	−0.023***	−0.011	−0.023***
					(0.008)	(0.008)	(0.007)	(0.008)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ZIP FE	No	Yes	No	No	No	No	No	No
Firm FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	No	No	Yes	Yes	Yes	Yes	Yes
Cluster by County	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of Firms	8,218	8,218	8,218	8,218	8,218	8,218	8,218	8,218
Firm-Year Obs	16,436	16,436	16,436	16,436	16,436	16,436	16,436	16,436
Adjusted R^2	0.0003	0.126	0.470	0.470	0.470	0.470	0.470	0.470

Note: Table reports the full sample estimation results of impairment analysis. Dependent variable is the share of loan balances that are not paid on time within the agreed terms for a firm's continuously reported loans (PCTIMPAIRED$_{it}$). Our preferred model is in Column 5, in which we also include an indicator for firms located in Texas to control for any potential systemic differences between these firms and those in other states. Disaster area represents being in one of the 41 counties that were eligible for federal aid in the presidential disaster declaration DR-4332-TX. Regressions report robust standard errors clustered by county. Stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE A.12

Share of Balances that are Impaired, Differing Treated Firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I(POSTHARVEY) ×							
I(NOFLOOD)	0.040***	0.027*	0.048**	0.032**	0.056**	0.038**	0.042***
	(0.014)	(0.014)	(0.019)	(0.014)	(0.024)	(0.018)	(0.016)
I(LOWFLOOD)	0.046***	0.031**	0.060**	0.038**	0.073	0.062***	0.035*
	(0.017)	(0.015)	(0.030)	(0.015)	(0.057)	(0.022)	(0.019)
I(HIGHFLOOD)	0.097***	0.096***	0.084**	0.086***	0.117***	0.084***	0.121***
	(0.019)	(0.014)	(0.035)	(0.020)	(0.033)	(0.019)	(0.030)
I(TX)	−0.019	−0.014	−0.016	−0.016	−0.014	−0.018	−0.013
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.017)	(0.018)
Treated Firms in Disaster Area	All	Harris	Excl. Harris	Inland	Coastal	High Inc.	Low Inc.
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by County	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of Firms	2,614	2,018	1,577	2,337	1,258	1,901	1,690
Firm-Month Obs	5,228	4,036	3,154	4,674	2,516	3,802	3,380
Adjusted R^2	0.581	0.591	0.570	0.589	0.571	0.577	0.588

Note: Dependent variable is the share of loan balances that are not paid on time within the agreed terms for a firm's continuously reported loans (PCTIMPAIRED$_{it}$). The control groups in Columns 1 to 7 are the same – they are firms outside the Harvey disaster area, while the treated firms (inside disaster area) differ. More specifically, the treated firms are: all firms in the disaster area in Column 1, firms in Harris County (where Houston is located) in Column 2, firms in the disaster area but outside Harris County in Column 3, firms in the inland counties inside the disaster area in Column 4, firms in the coastal counties inside the disaster area in Column 5, firms in the high-income tracts (HI, median household income above the median of all tracts in disaster area) inside the disaster area in Column 6, and firms in the low-income tracts (LI, median household income below the median of all tracts in disaster area) inside the disaster area in Column 7. Disaster area represents being in one of the 41 counties that were eligible for federal aid in the presidential disaster declaration DR-4332-TX. Regressions report robust standard errors clustered by county. Stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE A.13

Share of Balances that are Impaired, Heterogeneity by Industry Categorization

	Industry by Spatial Concentration		Industry by Customer Segmentation	
	(1) Local	(2) Traded	(3) B2B	(4) B2C
I(POSTHARVEY) ×				
I(NOFLOOD)	0.027 (0.017)	0.024 (0.024)	0.022 (0.024)	0.029 (0.024)
I(LOWFLOOD)	0.049** (0.020)	0.036 (0.031)	0.030 (0.025)	0.038 (0.026)
I(HIGHFLOOD)	0.098*** (0.020)	0.059 (0.036)	0.093*** (0.024)	0.075** (0.029)
I(TX)	0.001 (0.020)	−0.001 (0.027)	−0.019 (0.026)	0.009 (0.026)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Cluster by County	Yes	Yes	Yes	Yes
No. of Firms	2,042	1,065	1,208	1,334
Firm-Year Obs	4,084	2,130	2,416	2,668
Adjusted R^2	0.588	0.610	0.588	0.592

Note: Table reports estimation results of impairment analysis by a firm's industry categorization. Columns 1 and 2 estimate our preferred model (Column 5 of Table 3) separately for local and traded firms. Columns 3 and 4 estimate the preferred model separately for business-to-business (B2B) and business-to-consumer (B2C) firms. Dependent variable is the share of loan balances that are not paid on time within the agreed terms for a firm's continuously reported loans (PCTIMPAIRED$_{it}$). The models include firm fixed effects, year fixed effects, and control variables. Regressions report robust standard errors clustered by county. Stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

In Table A.13, we explore heterogeneity in the effects of flooding on loan impairments by business industry across two dimensions: spatial concentration (local versus traded) and customer segmentation (B2B versus B2C). In Columns (1) and (2), we classify each firm as local (i.e., those that sell primarily to the local market) or traded (i.e., those that sell primarily across regions and counties) using its SIC code. The categorization, developed by Porter (2012), is determined

based on geographic concentration of industry-level sales by using the Benchmark Input-Output Accounts data from the U.S. Bureau of Economic Analysis (BEA). We estimate our preferred model (Column 5 of Table 3) separately for local and traded firms and show that the significant effects of flooding are mainly attributable to small businesses that serve local customers (see column 1). The estimated effects on traded firms are not statistically significant (see column 2). This suggests that the negative flooding effects are amplified within small firms that rely on local demand.

In Columns (3) and (4), we divide each firm into B2B (i.e., those that sell primarily to businesses) or B2C (i.e., those that sell primarily to households) and estimate the preferred model separately for each subgroup. The categorization is developed by Delgado and Mills (2020) and determined by the share of industry-level output sold for household consumption. We observe a significant increase in loan impairments from both B2B and B2C firms that experienced severe flooding, suggesting widespread effects of flooding regardless of customer types.

TABLE A.14

Share of Balances that are Delinquent, Collections, and Legal Filings

	PCTDELINQUENT				Collection	Legal Filing
	1-30 days (1)	31-60 days (2)	61-90 days (3)	90+ days (4)	(5)	(6)
	Panel A: Active Borrowers					
I(POSTHARVEY) ×						
I(NOFLOOD)	0.014	0.006	0.012***	0.008	0.024**	−0.010
	(0.011)	(0.006)	(0.005)	(0.009)	(0.011)	(0.014)
I(LOWFLOOD)	0.016	0.013*	0.013***	0.004	0.010	−0.021
	(0.017)	(0.007)	(0.005)	(0.009)	(0.024)	(0.021)
I(HIGHFLOOD)	0.059***	0.011	0.020***	0.006	0.019*	−0.014
	(0.014)	(0.009)	(0.005)	(0.009)	(0.011)	(0.028)
No. of Firms	2,614	2,614	2,614	2,614	2,614	2,614
Firm-Year Obs	5,228	5,228	5,228	5,228	5,228	5,228
Adjusted R^2	0.368	0.116	0.420	0.737	0.961	0.608
	Panel B: High-Credit-Score Active Borrowers					
I(POSTHARVEY) ×						
I(NOFLOOD)	0.027**	0.002	0.005	−0.0001	0.014	0.011
	(0.013)	(0.006)	(0.004)	(0.004)	(0.010)	(0.010)
I(LOWFLOOD)	0.024	0.007	0.001	−0.010***	0.006	−0.003
	(0.018)	(0.009)	(0.004)	(0.003)	(0.014)	(0.011)
I(HIGHFLOOD)	0.076***	0.006	0.011*	−0.003	0.005	−0.025
	(0.017)	(0.006)	(0.006)	(0.004)	(0.013)	(0.029)
No. of Firms	1,799	1,799	1,799	1,799	1,799	1,799
Firm-Year Obs	3,598	3,598	3,598	3,598	3,598	3,598
Adjusted R^2	0.288	0.066	0.010	0.143	0.340	0.346
	Panel C: Low-Credit-Score Active Borrowers					
I(POSTHARVEY) ×						
I(NOFLOOD)	−0.016	0.011	0.026**	0.025	0.046	−0.071
	(0.027)	(0.014)	(0.012)	(0.033)	(0.035)	(0.044)
I(LOWFLOOD)	−0.010	0.018	0.037***	0.040	−0.016	−0.069
	(0.033)	(0.013)	(0.013)	(0.033)	(0.083)	(0.069)
I(HIGHFLOOD)	0.015	0.018	0.040***	0.026	0.046	0.008
	(0.026)	(0.021)	(0.012)	(0.037)	(0.041)	(0.055)
No. of Firms	815	815	815	815	815	815
Firm-Year Obs	1,630	1,630	1,630	1,630	1,630	1,630
Adjusted R^2	0.400	0.144	0.532	0.739	0.963	0.641

Note: Dependent variables from Columns 1 to 4 are the share of a firm's continuously reported loan balances that is delinquent (PCTDELINQUENT$_{it}$) at four different levels: 1-30 days delinquent, 31-60 days delinquent, 61-90 days delinquent, and over 90 days delinquent. Dependent variable in Column 5 is the total number of collections in the last 12 months (COLLECTIONS$_{it}$). Dependent variable in Column 6 is the total number of legal filings (i.e., tax liens, judgments, and bankruptcies) in the last 12 months (LEGALFILING$_{it}$). The models include firm fixed effects, year fixed effects, and control variables. Regressions report robust standard errors clustered by county. Stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE A.15

Ratio of Impaired Loans, Number of Loans

	PCTNUMIMPAIRED (1)	PCTDELINQUENT, Number of Loans				
		1-30 days (2)	31-60 days (3)	61-90 days (4)	90+ days (5)	Derogatory (6)
I(POSTHARVEY) ×						
I(NOFLOOD)	0.023	0.027*	−0.009	0.001	0.005	−0.001***
	(0.015)	(0.015)	(0.006)	(0.007)	(0.009)	(0.0003)
I(LOWFLOOD)	0.072***	0.046***	0.023**	0.002	0.001	0.0003
	(0.018)	(0.017)	(0.011)	(0.007)	(0.010)	(0.001)
I(HIGHFLOOD)	0.085***	0.049***	0.028***	0.011	−0.002	−0.002
	(0.019)	(0.018)	(0.008)	(0.007)	(0.011)	(0.002)
I(TX)	−0.004	−0.014	0.002	0.003	0.005	0.0001
	(0.019)	(0.016)	(0.008)	(0.008)	(0.010)	(0.0003)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by County	Yes	Yes	Yes	Yes	Yes	Yes
No. of Firms	2,614	2,614	2,614	2,614	2,614	2,614
Firm-Year Obs	5,228	5,228	5,228	5,228	5,228	5,228
Adjusted R^2	0.542	0.333	0.147	0.350	0.668	0.941

Note: Table reports the active borrower sample estimation results of impairment analysis. Dependent variable in Column 1 is the the number of loans that are not paid on time within the agreed terms divided by the total number of loans for a firm. Dependent variables from Column 2 to 6 are the ratio of a firm's number of loans that are delinquent at five different levels: 1-30 days delinquent, 31-60 days delinquent, 61-90 days delinquent, over 90 days delinquent, and having derogatory comments. Derogatory comments include bankruptcy, judgment, lien, etc. The mean and median number of loans as of June 2017 for a firm is 3.5 and 2, respectively. The models include time fixed effects, firm fixed effects, and control variables. Regressions report robust standard errors clustered by county. Stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE A.16

Summary Statistics: Subsidiary Firms

| | | | Inside Disaster Area | | |
| | | | No Flood | Low Flood ≤2.05 ft | High Flood >2.05 ft |
Variable	Total	Outside Disaster Area	No Flood	Low Flood ≤2.05 ft	High Flood >2.05 ft
Subsidiary Firms – Full Sample					
No. of Firms	1,376	591	507	138	140
EMPLOYEES	16.36	16.44	16.74	15.95	15.02
	[5]	[4]	[5]	[4]	[5]
	(40.88)	(45.48)	(37.82)	(31.14)	(39.81)
YEARSINFILE	18.38	21.79	16.55	14.75	14.21
	[15]	[21]	[14]	[11]	[12]
	(12.88)	(13.80)	(11.64)	(11.09)	(11.20)
INTELLISCORE	40.57	41.17	41.05	38.35	38.55
	[33]	[35]	[33]	[31]	[32]
	(23.39)	(24.14)	(23.58)	(20.89)	(21.77)
Subsidiary Firms – Active Borrower Sample					
No. of Firms	488	265	160	33	30
EMPLOYEES	24.74	21.34	27.19	29.45	36.53
	[3]	[0]	[6]	[9]	[6]
	(61.84)	(63.13)	(58.30)	(47.55)	(80.70)
YEARSINFILE	28.52	31.75	25.09	22.70	24.73
	[31]	[38]	[26]	[22]	[28]
	(11.67)	(10.85)	(11.48)	(12.07)	(10.87)
INTELLISCORE	45.31	43.46	47.51	46.91	47.90
	[46.5]	[43.5]	[50.5]	[45]	[53.5]
	(28.86)	(28.18)	(30.39)	(26.34)	(29.13)
PCTIMPAIRED	0.19	0.22	0.18	0.13	0.16
	[0.09]	[0.12]	[0.04]	[0]	[0.04]
	(0.25)	(0.26)	(0.26)	(0.23)	(0.24)

Note: Sample includes subsidiary firms with fewer than 500 employees. The values in the first, second, and third rows under each variable are means, [medians], and (standard deviations), respectively. Active borrowers include firms that have positive loan balances on both June 30, 2017 and June 30, 2018. All variables are from the firm's credit report on June 30, 2017.

TABLE A.17

Number of New Accounts Per Inquiry

	(1) Full Sample	(2) Borrowers	(3) Non-Borrowers	(4) High-Credit-Score Firms	(5) Low-Credit-Score Firms
I(POSTHARVEY) ×					
I(NOFLOOD)	−0.030	−0.027	−0.056	−0.027	−0.045
	(0.035)	(0.050)	(0.082)	(0.043)	(0.054)
I(LOWFLOOD)	0.010	0.020	−0.057	0.026	−0.014
	(0.029)	(0.040)	(0.063)	(0.037)	(0.057)
I(HIGHFLOOD)	−0.011	0.009	−0.056	−0.001	−0.008
	(0.068)	(0.076)	(0.099)	(0.083)	(0.066)
I(TX)	0.026	0.026	0.042	0.020	0.011
	(0.039)	(0.048)	(0.110)	(0.047)	(0.079)
ZIP FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Cluster by County	Yes	Yes	Yes	Yes	Yes
No. of Firms	2,365	1,553	812	1,404	956
Firm-Year Obs	2,365	1,553	812	1,404	956
Adjusted R^2	0.115	0.088	0.202	0.088	0.152

Note: Dependent variables are number of new accounts opened per inquiry (i.e., the number of new accounts observed in the past three months divided by the number of inquiries made in the past six months). Only firms that made any inquiries either pre- or post-Harvey are included. Regression models follow Eq. (1) with ZIP and year fixed effects (instead of firm and year fixed effects). Regressions report robust standard errors clustered by county. Stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

FIGURE A.8

Evolution in Probability of Having Postive Debt Balances
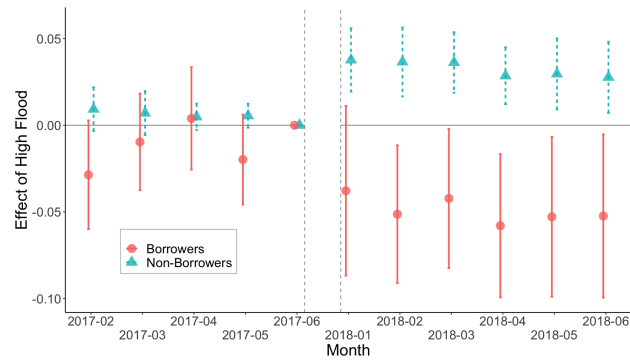
Note: We explore the probability of having any debt balances following Hurricane Harvey. The figure plots the 95% confidence interval of event study coefficients on the probability of having monthly credit balances on the high flood depth. June 2017 serves as the reference period. The vertical, dashed lines mark the period July to December 2017, during which we do not observe balances. Harvey occurred during that period.

Credit Report Analysis of Survey Sample

In Table A.18, we apply our credit report analyses (Section III) to the survey sample of 273 firms. After filtering out duplicate credit reports and firms with no 2017 credit record, we have a sample of 229 firms. For the survey sample analysis, we only keep 105 firms with positive continuously reported loan balances on both June 30, 2017 and June 30, 2018. We restrict the sample in this way in the impairment analysis as only firms that are actively borrowing can have loan impairments. We estimate:

$$Y_{it} = \beta_0 + \beta_1 I_t(\text{POSTHARVEY}) \times I_i(\text{NOTDISASTERAREA})$$

$$+ \beta_2 I_t(\text{POSTHARVEY}) \times I_i(\text{LOWFLOOD})$$

$$+ \beta_3 I_t(\text{POSTHARVEY}) \times I_i(\text{HIGHFLOOD})$$

$$\text{(A.1)} \qquad + \theta I_t(\text{POSTHARVEY}) \times X_i + \text{FE}_i + \text{FE}_t + \varepsilon_{it}$$

Note that there is one major difference from our estimations in Section III. Due to a small number of firms outside the disaster area (19 firms), we use firms in the disaster area but not identified as flooded ("I(NOFLOOD)") as our reference group.

Table A.18 reports the estimation results of flooding effects on loan impairments. The dependent variable is the share of loan balances that are not paid on time within the agreed terms. For reference, Column (1) repeats our preferred difference-in-differences results for our baseline Experian sample as specified in Section III (also reported in Table 3, Column 5). In Columns (2) and (3), we apply Eq. (A.1) to the baseline sample and the survey sample, respectively.

Table A.18 indicates that surveyed firms that experienced severe flood (flood depths exceeding 2.05 feet) had significant increases in the share of impaired balances. However, note that the small sample size of our surveyed firms means that our regression results might heavily rely on a small number of firms that had any changes in the credit outcomes of interest, or that there might be insufficient power to detect any flood effects.

TABLE A.18

Share of Balances that are Impaired: Baseline vs. Survey Sample

	(1)	(2)	(3)
I(POSTHARVEY) ×			
I(NOFLOOD)	0.040***		
	(0.014)		
I(NOTDISASTERAREA)		−0.040***	−0.024
		(0.014)	(0.139)
I(LOWFLOOD)	0.046***	0.006	0.010
	(0.017)	(0.009)	(0.107)
I(HIGHFLOOD)	0.097***	0.057***	0.057**
	(0.019)	(0.013)	(0.026)
I(TX)	−0.019	−0.019	
	(0.017)	(0.017)	
I(ORG_SURVEY)			−0.042
			(0.063)
Sample	Experian	Experian	Survey
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Cluster by County	Yes	Yes	Yes
No. of Firm	2,614	2,614	105
Firm-Year Obs	5,228	5,228	210
Adjusted R^2	0.581	0.581	0.585

Note: Table reports the survey sample estimation results of flooding effects on loan impairments. Dependent variable is the share of loan balances that are not paid on time within the agreed terms for a firm's continuously reported loans on both June 30, 2017 and June 30, 2018 (PCTIMPAIRED$_{it}$). The reference group is firms in the disaster area but who were not identified as flooded. We also control for the distribution method of the survey, i.e., whether through the letter-writing campaign or business organizations (I(ORG_SURVEY)). Regressions report robust standard errors clustered by county. Stars *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.