

Do Natural Disasters Affect Exposed Banks Differently?

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Motivation

- Number of local community banks keeps declining
⇒ dropped by 30 percent from 2012 to 2019 (FDIC (2020)).
- Increasing number of extreme weather events
⇒ 1 in every 10 homes were impacted by natural disasters in the US in 2021
- One may argue local community banks better accumulate local knowledge and soft information by geographical specialization. However, others may argue because of lacking of geographical diversification, the local banks suffer from idiosyncratic risk.
- Do natural disasters affect local banks differently?

Research questions

- 1 Do natural disasters impact banks' deposit-taking and lending, in terms of volumes and interest rates?
- 2 Are exposed local banks affected differently?
- 3 If Yes, what is a plausible channel in driving the heterogeneous impacts of natural disasters on local banks?

Main findings- deposit-taking and lending

	deposit-taking	lending
	volume / Interest rate	volume / Interest rate
non-local banks	↓/↑	↑/.
local banks	↑/↓	↑ +/↓

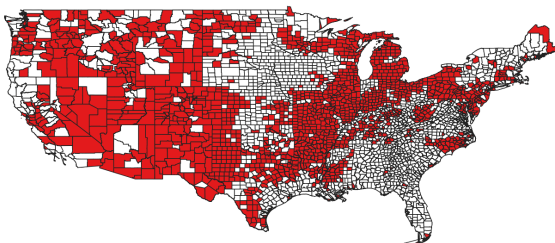
- The deposit inflows to local banks are particularly strong in counties with higher social capital index, number of non-profit organizations and religious adherence, which highlights the deposit inflows are driven by the better social connection between local banks and the communities.

Contributions

- Identify the impacts of natural disaster risk on banks (Klomp, 2014; Cortés and Strahan, 2017; Garbarino and Guin, 2021).
- Highlights the unique role of local banks in weathering local community from natural disasters (Koetter et al., 2020; Allen et al., 2022).
- Speaks to the role of social networks in economic decisions (Hong et al., 2005; Rantala, 2019; Persson et al., 2021).

Data

- Sample period 2018-2019
- **Natural disasters:** Spatial Hazards Events Database for the US (Sheldus)-date, location and type(hurricane, severe storm and flood, etc.) County-level
- The geographical distribution of natural disasters in 2018-2019.



Data Cont.

● Bank financial information

⇒ FDIC Summary of Deposits

- Branch-level deposits for FDIC-insured institutions (total deposits held, location and parent bank)
- Low frequency of data (annual)
- Only contains deposit data

⇒ Call Reports

- Document the quarterly bank-level data

⇒ RateWatch

- Obtain information of branch-level deposit and loan interest rates.
- 12-month fixed rate certificate of deposits
- 60-month new automobile loans and personal unsecured loans

Empirical Analysis

$$Y = \beta_0 + \beta_1 \text{Natural disaster} + \beta_2 \text{Local bank} + \beta_3 \text{Natural disaster} \times \text{Local bank}$$

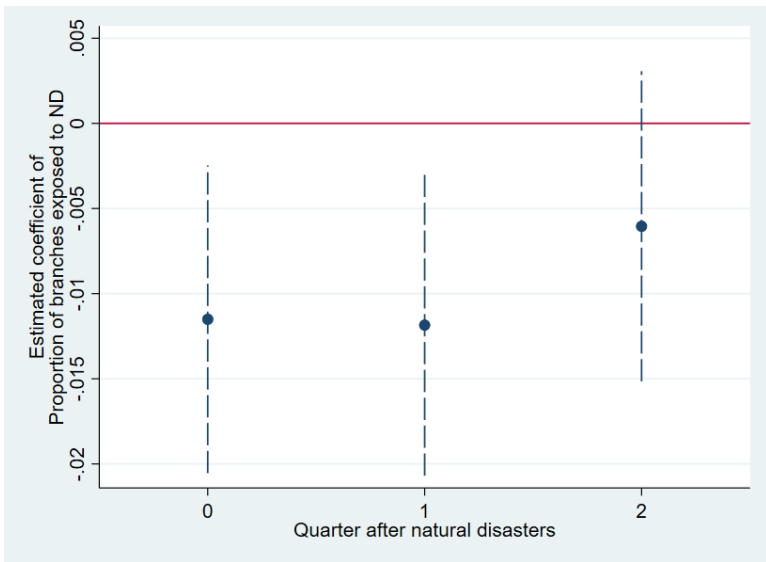
- Y : Dependent variables of interest: volumes and interest rates of deposits and lending
- *Natural disaster*: equals to 1 if the bank/branch experience at least 1 natural disaster in the year and 0 otherwise .
- *Local bank_{*i,t*}*: equals to one if the bank is a local bank and 0 otherwise
- Control for a vector of a year-lagged bank-level control variables, e.g., logarithm of assets value, interest-to-deposits ratio
- Control for state \times year fixed effects

Results-Branch deposits volume

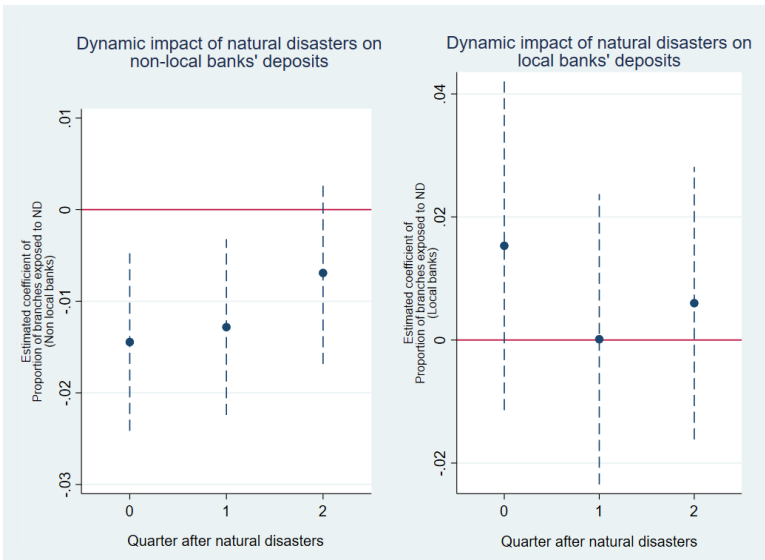
	1	2	3
Dependent variable	Deposit volumes- branch(ln)		
Disaster	-0.053*** (-2.76)	-0.030** (-2.09)	-0.033** (-2.19)
Local Bank			0.096*** (4.20)
Disaster x Local Bank			0.053** (2.03)
Observations	165,869	165,869	165,869
R-squared	0.099	0.202	0.203
State x Year FE	Yes	Yes	Yes
Bank controls	No	Yes	Yes

- Natural disasters cause 5.3% increase in deposits of local banks. The results support a redistribution of deposits among banks after natural disasters.

Results-Dynamic effect of natural disasters on bank deposits



Results-Dynamic effect of natural disasters on bank deposits



Results-Branch deposits interest rates

	1	2
Dependent variable	Interest rates of 12-month CDs (%)	
Disaster	0.025*** (2.68)	0.028*** (2.91)
Local Bank		0.146*** (2.93)
Disaster x Local Bank		-0.083* (-1.92)
Observations	78,532	78,532
R-squared	0.438	0.440
State x Year x Quarter FE	Yes	Yes
Bank controls	Yes	Yes

- On average, there is a relative decrease in the supply of deposits following natural disasters, but an increase in supply of deposits for local banks, hinting at a reallocation of deposits between local and non-local banks.

Results-Bank lending volumes

	1	2
Dependent variable	Total lending (ln)	
Disaster	0.021*** (2.91)	0.015** (1.96)
Local Bank		-0.077*** (-3.23)
Disaster x Local Bank		0.051** (2.14)
Observations	41,949	41,949
R-squared	0.891	0.891
Year x Quarter FE	Yes	Yes
Bank controls	Yes	Yes

Results-Bank loan rates

	1	2	3	4	5	6
Dependent variable	Interest rates (%)					
Sample	Auto New- 60 Mo Term			Personal Unsecured Loan - Max Term		
Disaster	-0.065 (-1.33)	-0.071 (-1.35)	-0.061 (-1.20)	-0.345 (-0.34)	-0.469 (-0.42)	0.023 (0.02)
L1.Disaster		-0.105* (-1.90)			-0.959 (-0.70)	
L2.Disaster		-0.012 (-0.22)			-0.658 (-0.55)	
Local Bank			-0.037 (-0.26)			1.248 (0.27)
Disaster x Local Bank			-0.089 (-0.50)			-6.203* (-1.69)
Observations	16,725	16,725	16,725	13,052	13,052	13,052
R-squared	0.244	0.244	0.244	0.218	0.218	0.218
State x Year x Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes

Deposit inflows to local banks-Social connection

	1	2	3	4	5	6
Dependent variable	Bank-level deposit volumes(ln)					
Sample split	Social capital index		No. of non-profit organizations		Religion adherence	
	$\leq p50$	$> p50$	$\leq p50$	$> p50$	$\leq p50$	$> p50$
Disaster x Local Bank	0.015 (0.37)	0.071** (2.28)	0.005 (0.12)	0.069* (1.75)	0.006 (0.14)	0.091** (2.53)
Disaster	-0.029 (-1.25)	-0.044*** (-2.88)	-0.028** (-2.56)	-0.017 (-0.52)	-0.063** (-2.45)	-0.010 (-0.79)
Local Bank	0.104** (2.42)	0.083*** (3.63)	0.073*** (3.11)	0.069* (1.94)	0.099*** (3.07)	0.073*** (2.63)
Observations	83,078	82,088	81,879	83,287	83,081	82,788
R-squared	0.219	0.181	0.118	0.166	0.210	0.201
State x Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes

Other possible channels

Sample split analyses find ...

- Deposit inflows to local banks are particularly strong in counties with higher social connectedness
 - speaks to social connection channel which expects that depositors support local banks more due to the connection between local banks and their community.
- no evidence that bank soundness(tier 1 capital ratio and net income to asset ratio), market power(HHI and three-firm concentration index)and government assistance(U.S SBA disaster loan)can explain the deposit inflows to local banks.

Conclusion

- Natural disasters, on average, reduce the supply of deposits, leading to a reduction of deposit volumes and an increase in deposit interest rates. Banks increase lending after natural disasters without adjusting interest rates of loans.
- Local banks experience deposit inflows, leading to an increase in deposit volumes and reduction in deposit interest rates. Following the deposit inflows, local banks increase more lending.
- Particularly in counties with higher social connectedness.
- Highlighting the unique role of local banks in weathering local disaster shocks. During adverse shocks to local economies, local banks utilize these advantages to attract deposits at lower cost to increase credit supply.

References I

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Thank you!