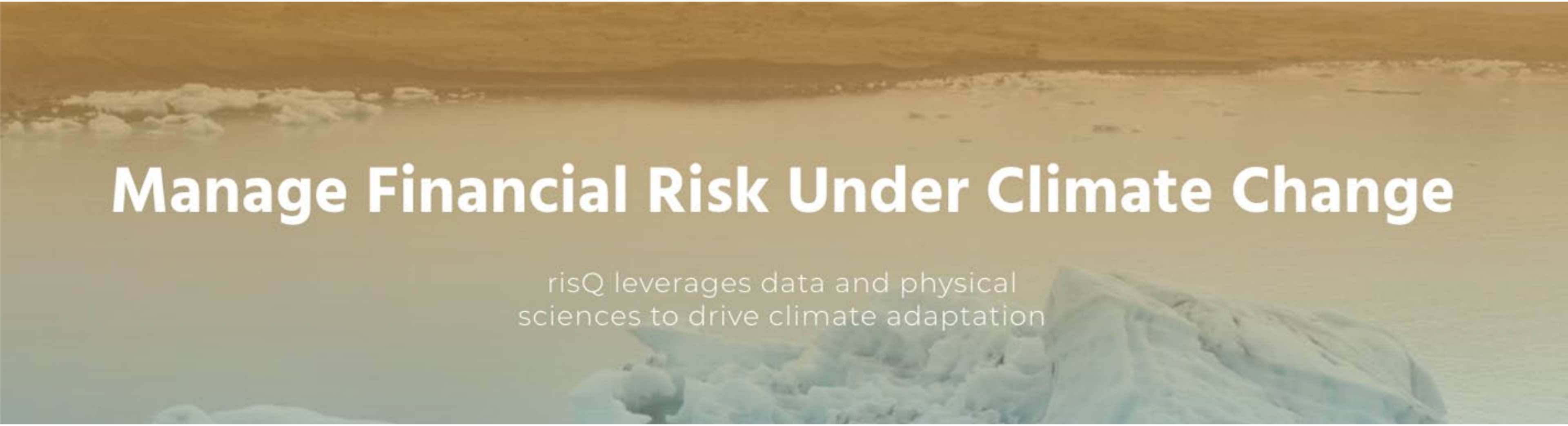


Fixed Income Analytics

Delivering Solutions to 25+ Leading Asset Managers, Banks, Bond Insurers, Rating Agencies in U.S. Fixed Income

Data file, web user interface, and API products:

Municipal Finance

Unparalleled and comprehensive library of the precise spatial footprint of U.S. debt issuers, allowing for rich climate and social characterization

CUSIP-level coverage for ~98% of all $3.9T in outstanding U.S. municipal debt, delivered in partnership with InterContinental Exchange

Portfolio analysis, real-time risk monitoring, weekly market commentary, monthly deep dive research, and automated data & report generation tools

ESG-as-a-Service

Enter an address anywhere in the US, and within minutes, get back an in depth report with analytics on climate and environmental risk, social vulnerability and impact, and governance

Customizable API calls allowing users to enter asset characteristics to inform asset-level climate risk analysis

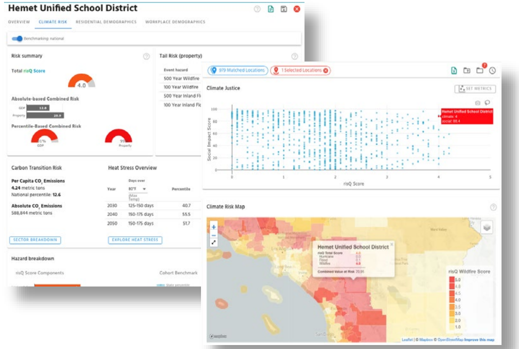
Analytics at both the asset level as well as the surrounding neighborhood, customizable by drive time radius

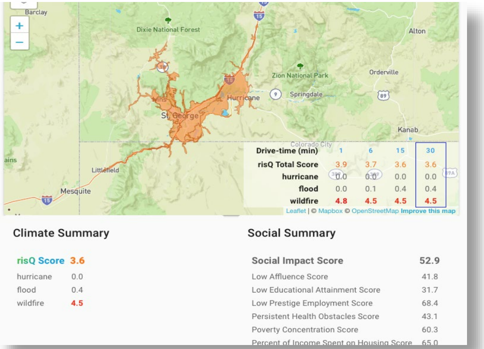
Securitized Real Estate

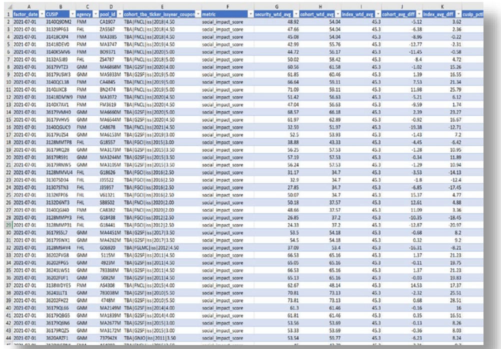
One-of-a-kind model linking trillions in government backed loan collateral to space, allowing for detailed and precise climate and ESG analysis, in partnership with Level11 Analytics

~95% coverage of all outstanding real estate securities and loan value

Comprehensive residential and commercial mortgage-backed security analytics, serving risk and ESG applications







risQ's models climate risk for key US Fixed Income securities

Hazard

Vulnerability

Unifying Damage Functions

Exposure

GDP

Quantify the impact of climate change risks on key, local GDP generators

Jobs

Analyze climate risk to city workforces — slice and dice by affluence and industry type

Retail

Understand & benchmark retail risk by location in terms of business interruption and real estate risk

Property Value

Measure property and tax value at risk to climate change-driven hazards

Transit

Quantify and visualize the impact of climate risk on local transit effectiveness and infrastructure

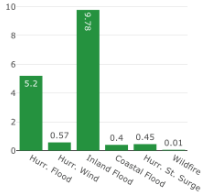
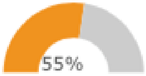
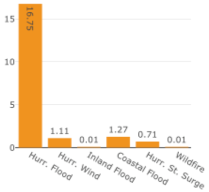
Flight Risk

Explore plausible grey and black swan population flight risk and their economic implications

Climate risk analytics for all use cases

risQ's comprehensive climate risk data is used by larger client teams, while all clients can use to the risQ Score to compare securities, evaluate portfolios and benchmark to indices

High granularity data, but not easily absorbed

	Percentiles	**Perils and VaRs**
Property Value at Risk		
GDP Impairment Risk		

risQ Score

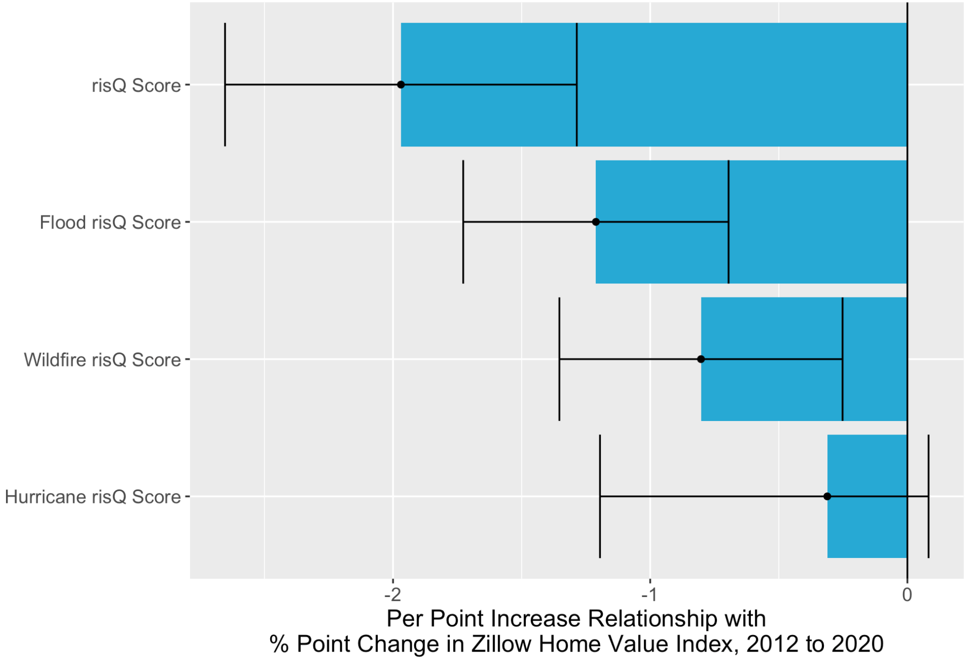
- ✓ Unified metric on a 0-5 scale
- ✓ Applicable at CUSIP and portfolio levels
- ✓ Built on accessible, underlying data
- ✓ Also broken into Flood, Hurricane and Wildfire risQ Score components

Higher Climate Risk → Lower Home Price Appreciation

Using Zillow Home Value Index data at county level, we show the relationship between our 0-5 **risQ Score** and property value change from 2012 to 2020.

After accounting for regional trends (state as a control variable), urbanization (population density), and affluence (through risQ's Social Impact Score), the marginal relationship between each one-point score increment and property value change (with 95% confidence intervals) is:

- **risQ Score**: -2.0% (-2.7%, -1.3%)
- **Flood risQ Score**: -1.2% (-1.7%, -0.7%)
- **Wildfire risQ Score**: -0.8% (-1.4%, -0.3%)
- **Hurricane risQ Score**: -0.3% (-1.2%, 0.1%)



Increasing the risQ Score by one integer holding all else constant implies a -2% discount for home price appreciation, and a -10% impact across the full 0 to 5 scale.

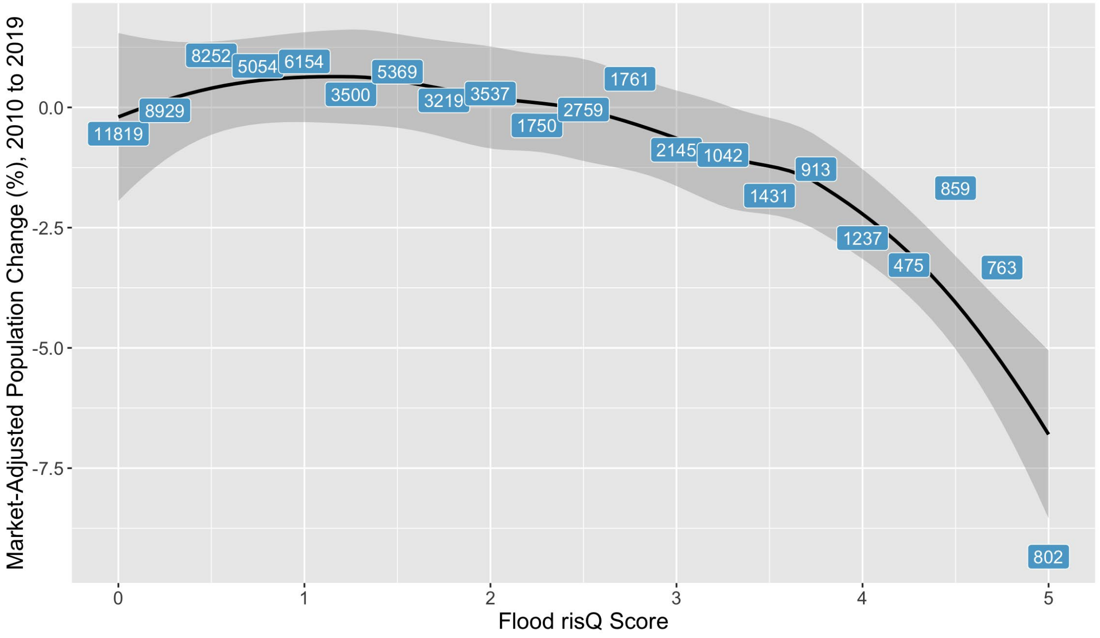
Higher Flood Risk → Lower Population Growth

Using American Community Survey data at the census tract level, we show the relationship between our 0-5 **Flood risQ Score** and population change from 2010 to 2019.

After accounting for regional trends (state as a control variable), urbanization (population density), and affluence (through risQ's Social Impact Score), the marginal relationship at each 0.25 **Flood risQ Score** increment shows increasing negative impact on population

Number of census tracts in each group shown in labels

95% confidence intervals shown as a grey band



At Flood risQ Scores of 3.5 and above, flood risk is a *high* confidence driver for net population loss. In the census tracts with the highest risk, overall size of population is impaired by 6.5% over 10 years

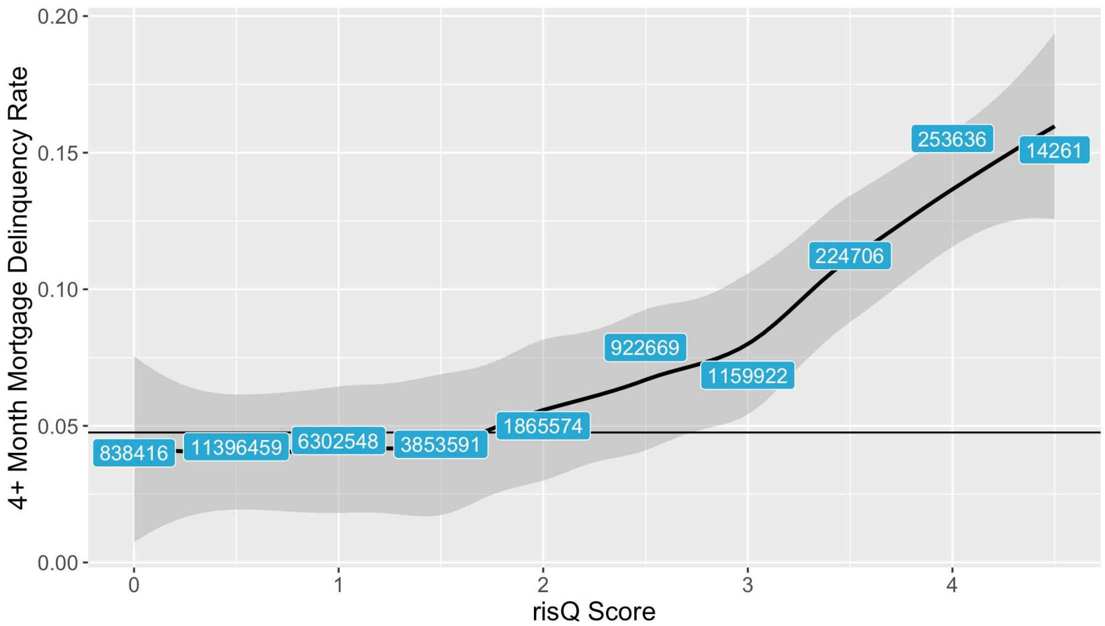
Higher Climate Risk → Higher Loan DelinQuency

Using 27 million Fannie Mae and Freddie Mac loans originated from 2006 to 2018 and at Zip-3 level, the relationship between our 0-5 **risQ Score** and mortgage payment delinQuency is clear.

Controlling for macroeconomic, loan attributes, state-level factors, and localized socioeconomics, each 0.5 increase in **risQ Score** increment shows increasing likelihood of delinquency from 2, and accelerating and outside of 95% confidence intervals from 3 upwards

Number of loans in each group shown in labels

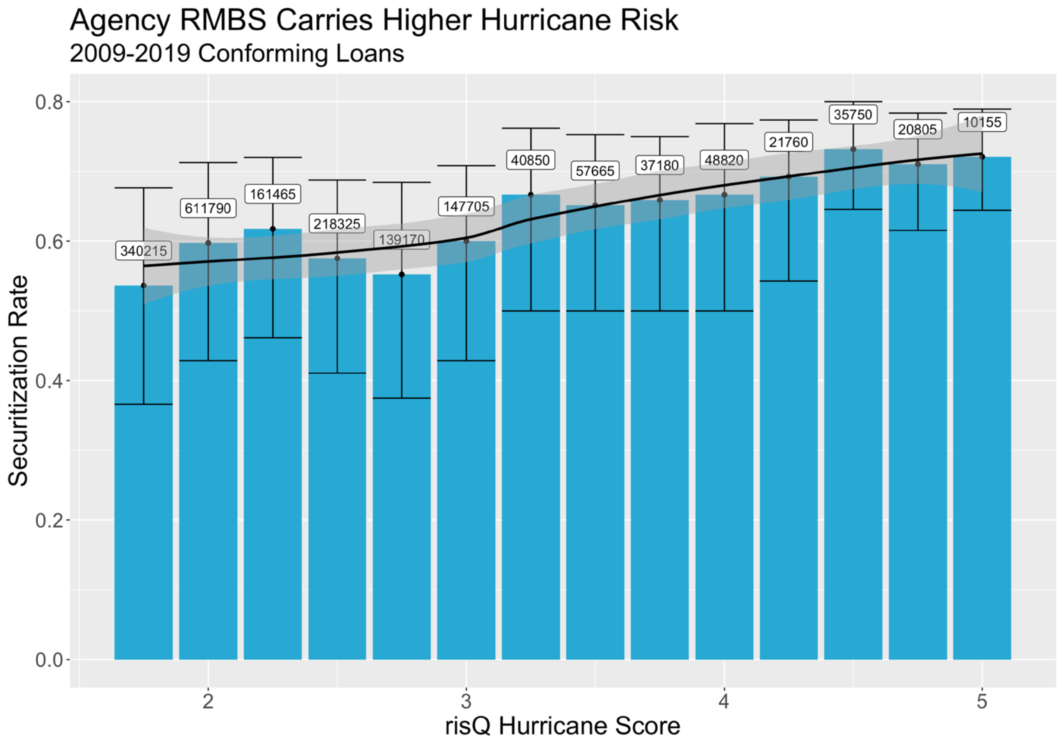
95% confidence intervals shown as a grey band



At risQ Scores of 3.0 and above, climate risk is a *high* confidence driver of loan delinQuency. For loans with the highest risk, delinQuency rates are 3 times higher than baseline rates

Fannie and Freddie Carry More Hurricane Risk

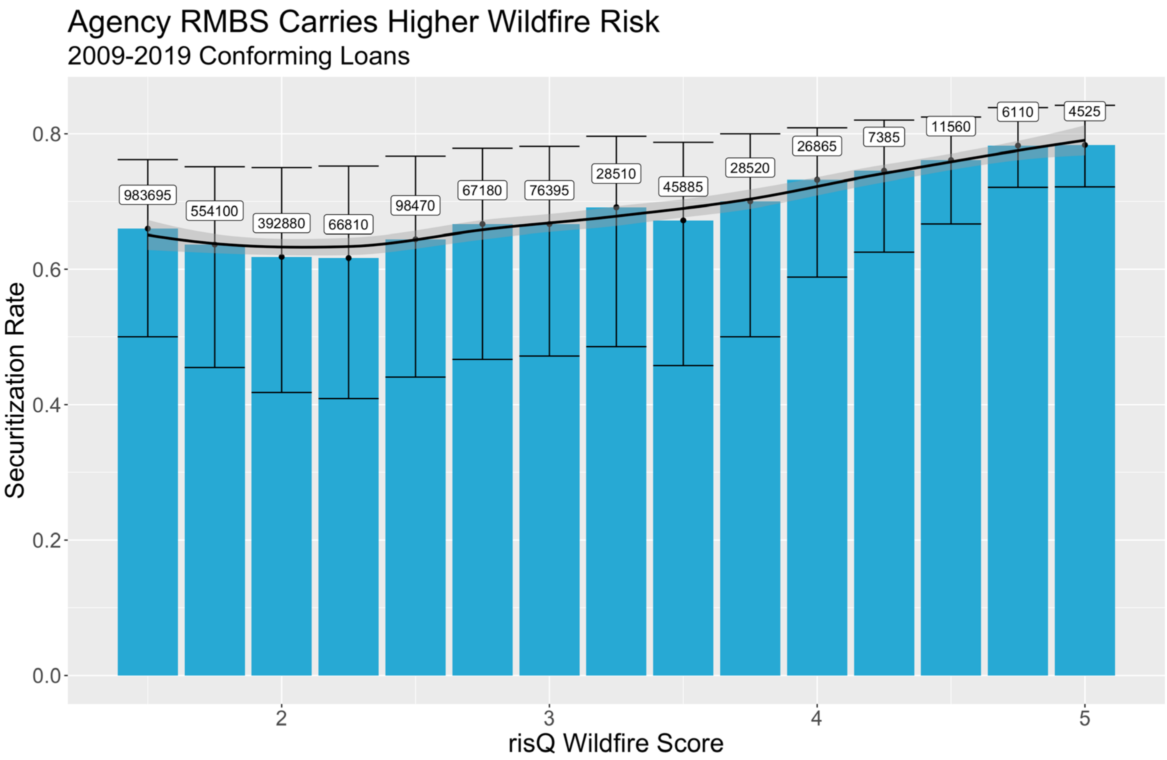
- Universe: 2009-2019 HMDA loans
- After econometrically accounting for capital market, supply-side, and socioeconomic factors…
- …securitization externalizes lender hurricane risk significantly.



Fannie and Freddie carry disproportionately high hurricane risk on their books, meaning investors are disproportionately exposed.

Fannie and Freddie Carry More Wildfire Risk

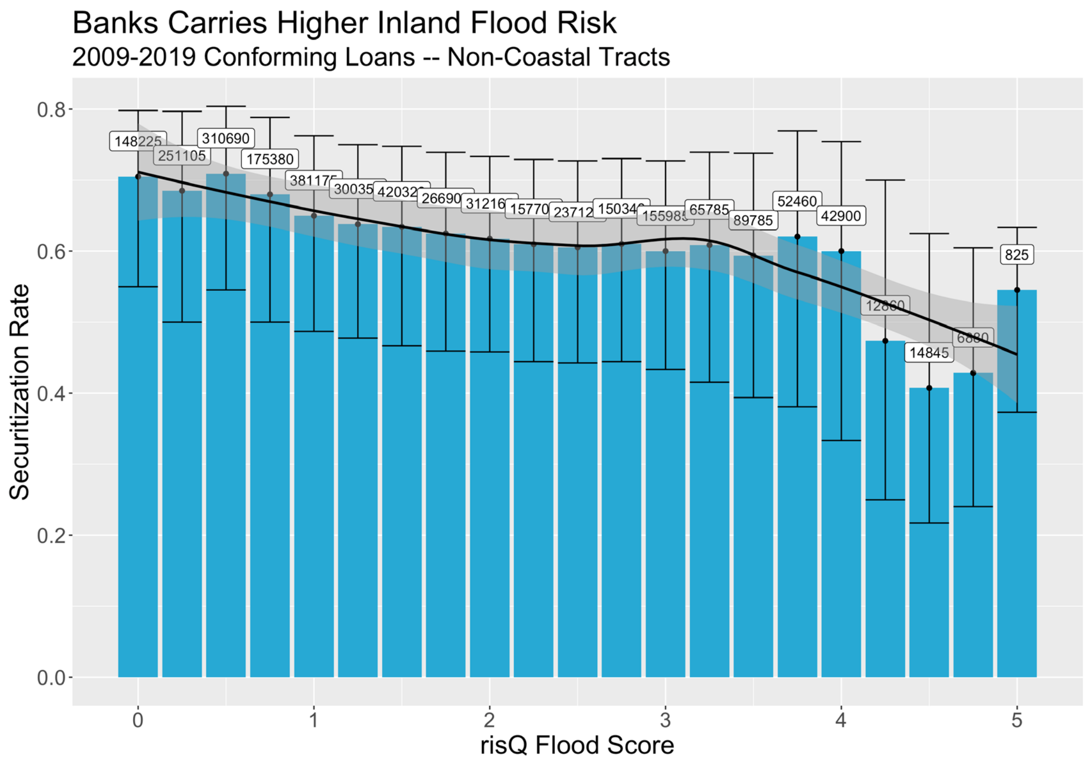
- Universe: 2009-2019 HMDA loans
- After econometrically accounting for capital market, supply-side, and socioeconomic factors…
- …securitization externalizes lender wildfire risk significantly.



Fannie and Freddie carry disproportionately high wildfire risk on their books, meaning investors are disproportionately exposed. Ginnie is even *worse*.

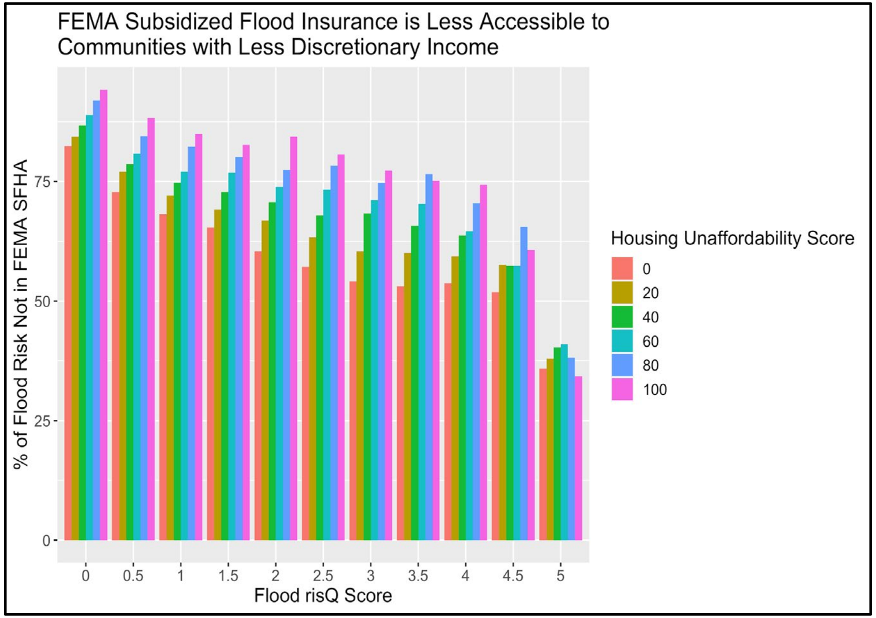
Banks Hold More Inland Flood Risk

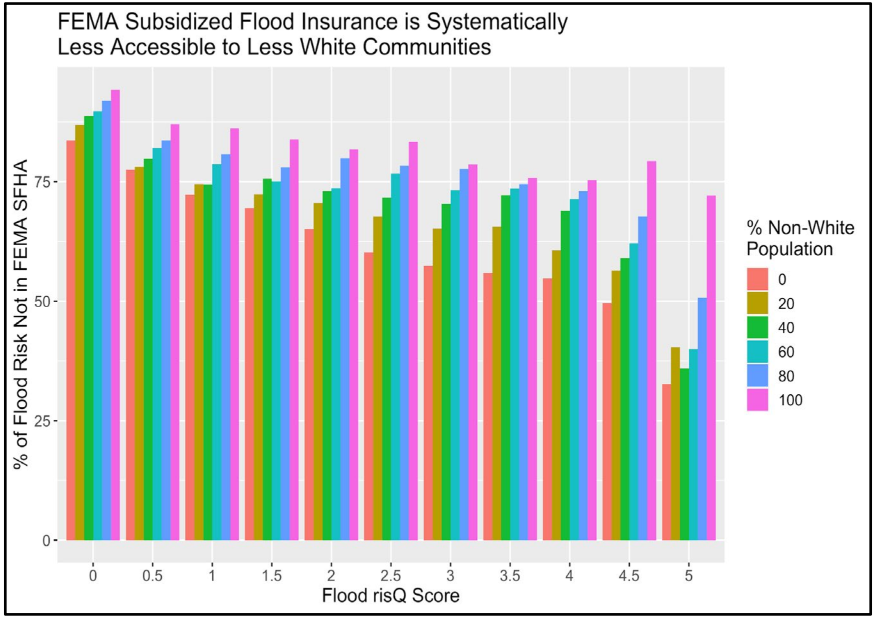
- Universe: 2009-2019 HMDA loans
- After econometrically accounting for capital market, supply-side, and socioeconomic factors…
- …securitization internalizes lender inland flood risk significantly.



Lenders are holding more single-family residential loans on their own books that are exposed to inland flood risk – the vast majority of that risk is uninsured

Flood Risk Captured By FEMA has Affluence & Race Correlation





There is a broader ESG conflict to be addressed in the ways climate risk could disproportionately and structurally leave the historically disadvantaged behind a.k.a. climate (in)justice

Start a Conversation

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