

California Wildfires, Property Damage, and Mortgage Repayment¹

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Natural disasters in the U.S. have become more frequent and more damaging over time. In recent years, large wildfires led to \$17 billion in damages per year, more than ten times the annual wildfire damages between 1990 and 2009. Negative wealth shocks and unanticipated expenses after wildfires can delay mortgage payments, restrict borrowers' access to future credit, and increase lenders' exposure to default risk. While homeowner's insurance mitigates this risk, protections have been weakening as physical climate risks increase. This paper studies the types and extents of risk that natural disasters present to the mortgage market, by evaluating the impact of wildfires on mortgage repayment.

Understanding the role of property damage on mortgage repayment

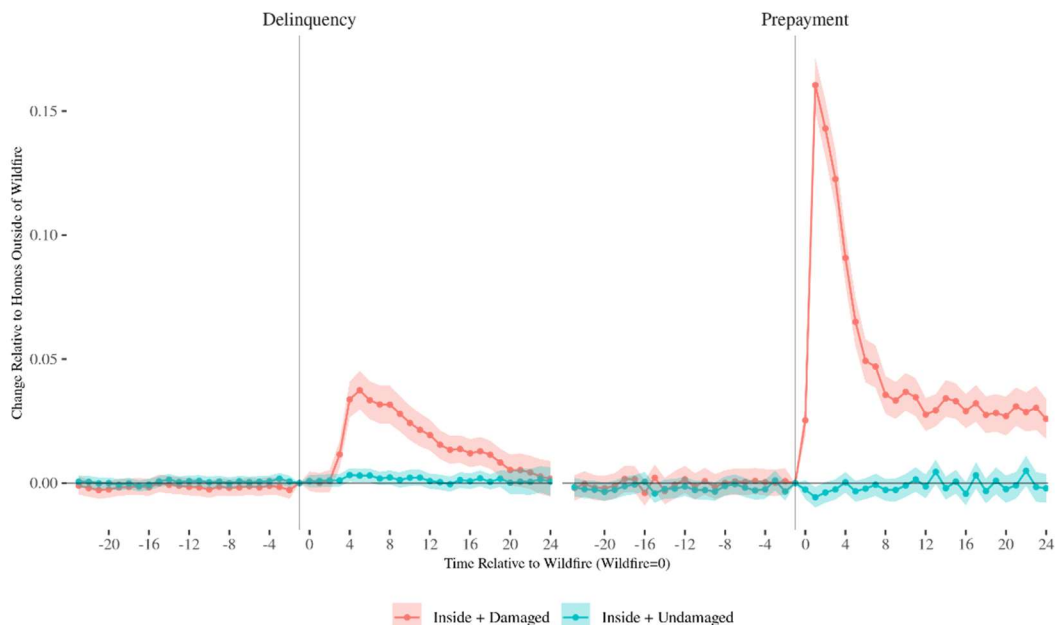
Our research measures the impact of 82 California wildfires on mortgage borrowers' likelihoods of delinquency and prepayment between 2013 and 2020.

We constructed a novel database that links property-level fire damage, from damage inspection reports to mortgages held by 24 large banks, that participate in the national stress-testing program. Inspection reports show that 59 percent of our sample properties inside fire burn perimeters are undamaged, suggesting burn perimeters are poor proxies for property damage. Using an event study specification, we estimate the impact of property damage on mortgage repayment in the 24 months after a wildfire. We separately identify the impact of wildfires on both damaged and undamaged properties within fire perimeters relative to our control group of properties that are 1-2 miles outside of the fire perimeters.

Wildfires pose higher risks to mortgage markets than estimated in previous studies.

For damaged properties, delinquency rates increase by 4 percentage points and prepayment rates increase by 16 percentage points after a fire. These changes in repayment represent *three times* the 1.35 percent delinquency rate and *eight times* the 2 percent prepayment rate in the baseline month before the fires. In contrast, wildfires have no significant impact on mortgage repayment for undamaged properties inside the fire perimeter. In total, 68 percent of damaged properties prepay in the two years after a fire compared to 34 to 36 percent of undamaged properties inside or outside the perimeter.

¹ The views expressed in this paper are solely those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of Philadelphia, Federal Reserve Bank of San Francisco, or the Federal Reserve System. Any errors or omissions are the responsibility of the authors.



Note: Figure plots estimates of the impact of wildfires on mortgage repayment in the 24 months before and after a fire. Coefficients measure the percentage point changes in delinquency (left) and prepayment (right) for damaged and undamaged properties, relative to properties outside the burn perimeter. Event study regressions include fire-month and loan fixed effects and control for time-varying loan and borrower characteristics. Shaded regions indicate robust 95% confidence intervals.

Borrowers use insurance claims to prepay mortgages rather than rebuild their home.

Only 34 percent of damaged properties that prepay are sold or refinanced. Instead, most prepayments are due to borrowers using insurance claims to pay off their mortgages instead of rebuilding their home.

Borrowers are even more likely to prepay their mortgage when rebuilding costs are high and underinsurance is likely, such as for older homes that incur costs to comply with new fire codes and homes affected by large fires that lead to surges in local construction costs. Troublingly, this pattern suggests that borrowers are forced to prepay their mortgage because they are underinsured, where the insurance claim does not cover the actual costs of rebuilding. Mortgage-market participants may be more exposed to wildfire losses than expected if the primary safeguard of insurance does not fully cover rebuilding after properties are damaged.

Implications

- Wildfires pose higher risks to mortgage markets than estimated in previous studies. Delinquencies and prepayments are concentrated among damaged homes while most homes within the fire perimeter remain undamaged. Therefore, precise measurement of property damage from natural disasters are necessary to fully understand the consequences of physical climate risks.
- Higher prepayment can indicate lower household welfare if mortgage borrowers would have preferred to rebuild without frictions that lead to insufficient insurance claims.
- Insurance mitigates lenders' and investors' exposure to physical risks by a lesser degree than expected as it effectively shifts the associated default risks to prepayment risk.

- Whether properties within the fire zone sustain damage or not determines the resulting repayment trends after a fire. Damage mitigation efforts, such as property adaptations shown to reduce the likelihood of property damage given exposure to a fire, may effectively reduce the risks future wildfires present to the mortgage market.
- Higher prepayment can also indicate reductions in housing supply if insurance funds are not used to restore housing capital.