

## Faculty Research Update

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### **Local Labor Market Shocks and Residential Mortgage Payments: Evidence from Shale Oil and Gas Booms**

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*(Work in progress with Gregory Upton, Jr.)*

Understanding how changes to local labor market conditions impact household spending and savings decisions is a central topic in labor economics. To investigate the dynamics of this relationship, we examine mortgage payment choices of homeowners who purchased property in areas that later experienced a positive shock to local economic conditions via the shale oil and gas boom. Using a large loan-level dataset with detailed information on mortgage originations and monthly payments, we find that borrowers with properties located in areas with shale oil and gas booms experienced an approximately 6% reduction in the probability of missing mortgage payments.

After many years of declining crude oil production in the United States, recent technological developments have made the extraction of previously inaccessible energy resources feasible. Specifically, the advent of horizontal drilling and hydraulic fracturing techniques have enabled the exploration and production of oil and gas from "shale" geological formations, and lead to significant new drilling activity over the past decade. Contemporaneously, widespread declines in residential housing values and sharp increases in mortgage default rates in 2007-2009 were a central component of the Great Recession. Notably, in the midst of the Great Recession, the technological innovations that enabled shale oil and gas extraction provided a catalyst for an economic "boom" to clearly specified local areas where these previously inaccessible resources could now be profitably extracted. This research focuses on how this natural resource boom impacted local residents of areas where these resources were extracted. Specifically, we examine the impact of shale oil and gas discovery on long-term residents of six geographic areas that have the geological formations that allow for shale oil and/or gas extraction, namely: Bakken, Eagle Ford, Haynesville, Marcellus, Nibabrara, and Utica.

We estimate the impact of the shale boom on mortgage payment activity of individuals who purchased property in one of these areas prior to the natural resource discovery. Specifically, we examine the impact of the shale boom on the probability of mortgage default during a time period where aggregate default rates nationwide were sharply increasing. For the average homeowner, their house is typically the largest asset on their household balance sheet,

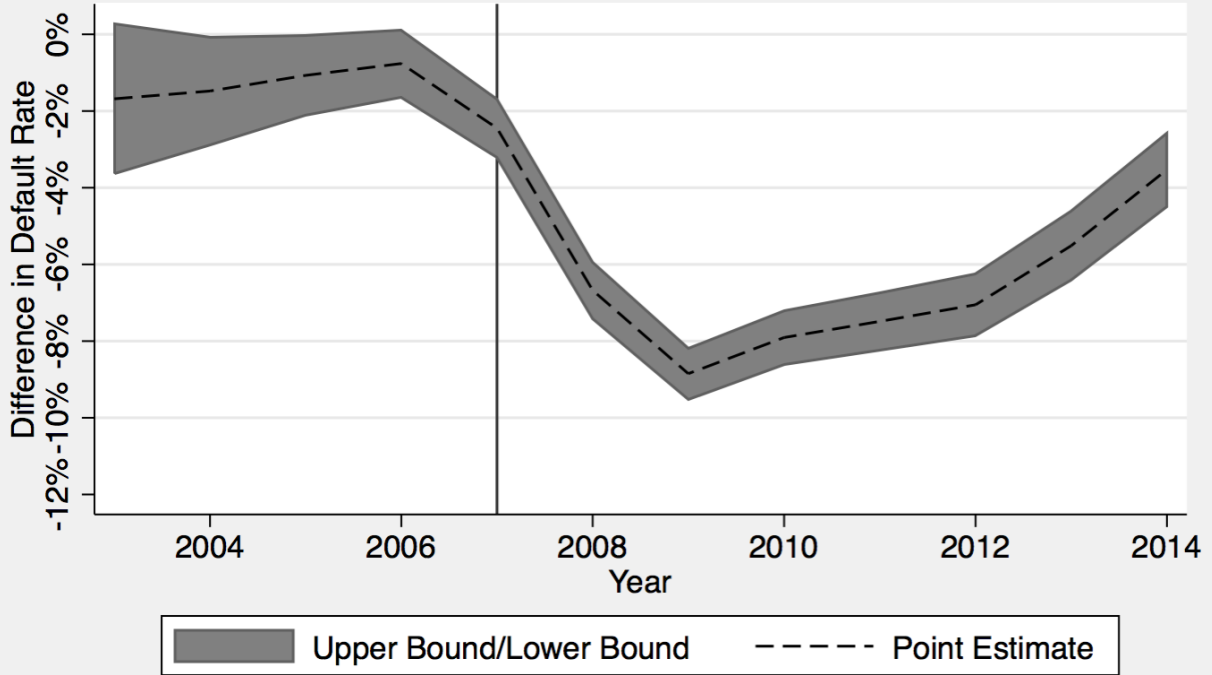
typically making up over two-thirds of a household's wealth. Additionally, for homeowners with outstanding mortgages, this loan is typically their largest financial obligation.

Using a difference-in-differences estimation framework, we find that borrowers with properties in counties with shale oil and gas resources experience, on average, a 6% reduction in the probability of mortgage default as compared to similar mortgages in non-shale areas after the boom began. This reduction in the probability of default reaches a maximum of approximately 7%-9% in 2009, during the peak of the shale boom, and attenuates to approximately a 1%-2% difference in default probabilities by the end of 2014. These results are robust to choice of control group, risk categories, alternate definitions of default, and placebo tests. Overall, our results provide evidence of a significant positive economic impact of shale oil and gas booms to long-term local residents where these natural resources are located.



# Differences in Default Rate

## Comparison of Shale and Non-Shale Areas by Year



Yearly differences after controlling for all covariates.  
95 percent confidence interval shown.